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THE EVOLUTION OF MAN
AND HIS CULTURE

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THE EVOLUTION OF MAN AND HIS CULTURE

by

H. C. BIBBY

Sometime Scholar of Queens' College
Cambridge

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TO MY PARENTS

“ We have to deal with Man as a product of Evolution, with Society as a product of Evolution, and with Moral Phenomena as products of Evolution.”

HERBERT SPENCER

PREFACE

THE AIM OF THIS BOOK is to present in a simple and easily read form an account of the way in which our species has evolved from others, and has developed through many thousands of years the complex society of to-day. For a proper appreciation of this development, it is necessary to call in the aid of many different sciences. Geology, botany, zoology, climatology, archæology, anthropology, and economics all can shed light. The difficulty is to select from this profusion just so much of each science as to give the maximum illumination in the minimum space. In this selection it is inevitable that much over-simplification should have taken place, and the specialist in any one science may consider its treatment as superficial. This is unfortunate, but it cannot be helped. In self-defence, the author wishes to make it clear that he is acutely aware of the unjustifiable dogmatism that has perforce crept into the discussion of many points and of the very dubious nature of many of the dates given. But between dogmatism and chaos, he has chosen the former.

It is hoped that the book will prove suitable for use as a text book in a general cultural course in schools and adult classes.

Thanks are due to Miss Minnie Feintuch, Miss Lena Evans, and my wife for their help in the preparation of the book, and to Mr. E. H. Seal for reading the proof.

H. C. BIBBY

CHAPTER I

MAN AND THE BEASTS

"Nature, which governs the whole, will soon change all things which thou seest, and out of their substance will make other things, and again other things from the substance of them, in order that the world may be ever new."

MARCUS AURELIUS
c. 170 A.D.

EVERY CHILD VISITOR to the Zoo remarks upon the similarity of man and monkey, and very nearly every cartoonist has at some time or other made use of it. There is no doubt about it—in general form, in the number of its fingers and toes, in its head and in its face, the monkey of all animals approaches closest to man. But despite this similarity, a man is generally recognisable as a human being, even though some of our left-wing cartoonists may occasionally appear to have doubts about Mussolini. When many individuals can be recognised in this way as being all of the same kind, they are said all to belong to one "species." There may of course be variety within the one species—all the individuals in it are not identical. A ginger cat can be distinguished from a tortoise-shell, a racehorse from a dray horse, and Mr. Eden from Mr. Pollitt, but even between these last two the distinction is hardly as great as that between Mr. Lloyd George and one of his pigs. The idea of "species" then seems fairly clear: the Cat is one species, the Dog is another, the Lion, the Tiger, the Leopard and the Kangaroo are others.

How does it come about that there are in the world so many different species of animals and plants? How is it that there are so many different moths, so many different

snakes, so many different kinds of turtle? Why does the kangaroo live in Australia and the elephant in India and in Africa? In short, how has the world come to its present state? There is one very simple explanation that fits most of the facts. It is simply that God created all the animals and plants that we now see, and fitted them perfectly for life in their allotted spheres. He gave the monkey a tail to help it to climb, and the bird He gave wings to enable it to fly. Those who like such a theory may hold it. But there have been other attempts at explanation. The Frenchman, Jean Lamarck, considered that the forms and sizes of animals changed when the conditions changed, in such a way as to adapt the animal to its environment. Thus, to take a classic example, the giraffe has a long neck because for generations its forbears had stretched up to the tops of trees for food, and in the process the neck had lengthened. But the times changed, and with them theories. Malthus wrote his *Essay on Population*, and Charles Darwin and Alfred Wallace, reading it, had the one thought. If the human population of the world is kept down by the checks of hunger, disease, and war, must not similar checks operate in the animal world? And if they do operate, if there is a continual killing off of part of the population, is it not likely that the weak and the slow will be killed off first? Will not this killing tend to favour those individuals who are quickest, strongest, best able to hide from their foes, most attractive to the other sex? In fact, will it not lead to a "Survival of the Fittest"? This is the theory of Darwin and Wallace. In a modified form, it is the belief of virtually all biologists. It should be kept clearly in mind that Darwin did not first propound the "Theory of Evolution"—the theory that all species have not been specially created, but have evolved from simpler forms. His contribution was to present conclusive evidence for it, and to explain how it might have come about, by "natural selection" of the individuals best fitted to the environment.

The evidence for the theory of evolution is in the main

threefold. First, there are the observed facts of the present living world, and Darwin presented these facts in a particularly convincing way. On his voyage round the world in the *Beagle*, he was especially struck by the life of a group of islands known as the Galapagos Archipelago, which is situated some 600 miles west of South America. This archipelago consists of five larger islands and several smaller. They are all of volcanic origin, have probably never been connected to each other or to the mainland, and are of comparatively recent formation. In the words of Darwin: "The natural history of these islands is eminently curious, and well deserves attention." In general, the animals and plants are rather similar to those of South America, but they definitely belong to different species. Moreover, most of the species do not occur anywhere in the world outside these islands. Now if animals and plants have been specially created to suit the environment in which they live, how does it come about that these species, which occur nowhere else, and so must have been created specially for these islands, are so similar to the South American species of six hundred miles away? The environments of the two places are totally unlike, and one would expect totally unlike species to have been created. Indeed, the conditions of life are much more like those in the Cape Verde Islands off the coasts of Africa, yet the species are totally different from those occurring there. Darwin believed that the explanation must be that the archipelago had originally been populated from the neighbouring South American continent, and that the original population had become modified by the new conditions on the islands.

But there is much stronger evidence than this. Not only is the animal and plant population of the archipelago unique, but so is that of each individual island. Of the mocking-thrushes that Darwin collected, quite at random, all from Charles Island belonged to one species, all from Albemarle Island to another, and all from James and Chatham Islands to yet a third. Of the plants

of the pea family which are peculiar to the Galapagos Archipelago, thirty of the thirty-eight species found on James Island are confined to that one island, twenty-two out of twenty-six in the case of Albemarle Island, twelve out of sixteen in the case of Chatham Island, and twenty-one out of twenty-nine in the case of Charles Island. What can be the explanation of these truly amazing facts? Darwin has supplied it. According to him, the population of the archipelago came originally from South America, and has been modified by the new environment. In each island the competition that a new-comer would have to face would be different, and so the "natural selection of the fittest" would be different in each island. In other words, the different species now existent in the different islands have evolved in different directions from similar original immigrants. No other theory has ever been proposed which explains the facts so well.

The second line of evidence for the theory of evolution is that of the fossils. In the very oldest rocks only the very simplest forms of plants appear, and gradually, as newer rocks are examined, one sees more complex forms and finally the highest plants of all. By far the simplest explanation of this is that the simpler forms have gradually produced the more complex; that is the theory of evolution. Just the same story is told in the case of animals, and here the evidence is even clearer. Let us take as a particular example, the evolution of the horse. The very oldest fossils of horse-like animals are quite small, have five toes on each foot, and have quite simple teeth. The more recent fossils show a gradual increase in height from the eleven inches of the species *Eohippus*, which existed some five million years ago, to the sixty-four inches of the modern horse. They show a gradual loss of four toes from each foot, and a gradual development of larger and more complicated teeth. What can have caused these changes? The answer is clear. The climate has changed so that vast tracts of forest, whose marshy ground was best walked on by fairly spreading

feet, and whose succulent herbs required but little chewing, gave way to open stretches of grass-land, on which the speediest animals, i.e. those that were larger and ran, as does the modern horse, on the tip of a single toe, and the animals which could best chew and digest the much coarser food which grass-land provides, i.e. those whose teeth were larger and had a more corrugated surface, would stand the best chances of success and of natural selection. In other words, the changing animal is the product of the changing environment.

Thus there is evidence of evolution in the animals of to-day; there is evidence in the animals of yesterday; and there is even evidence in the animals of to-morrow. How do the animals of to-morrow come into being? Let us take man as an example. The female sex-cell or ovum joins with the male sex-cell or sperm, and the product of the fusion begins to grow and develop. The original single cell—reminiscent of some of the simplest forms of animal life—begins to divide, and is soon a little sphere or “morula” of cells, which gradually takes on shape by developing cavities and folds, and soon becomes like a very simple invertebrate animal, i.e. an animal without any backbone. Then the vertebræ form, and so do the nervous system, the heart, and the lungs and the brain. The developing embryo is now somewhat akin to an adult fish. Indeed, the embryo even develops traces of fish-like gills, which are later replaced by lungs. Gradually greater and greater complexity is developed, and the embryo becomes recognisably human. Nor does this recapitulation of the history of the race stop at generalities. Let us consider more fully the development of one particular organ, say the heart. At first it consists simply of two tubes, which then fuse to form a large central vessel with four branches—as the lowest vertebrate animals have. This central vessel then divides into two chambers, the “auricle” and the “ventricle,” and the adult fish has such a heart. The auricle then divides into a left and a right section, and the heart has three chambers, as with the adult

amphibian. Lastly, the ventricle divides, giving the four-chambered heart of the highest vertebrates. Other organs too provide similar evidence. Up to two months the embryo has a translucent skin like that of a fish; at six months it has a fine hairy covering like the apes. It is no doubt an exaggeration to say that each human embryo "climbs up its^{own} evolutionary tree," but there is a germ of truth in the statement. In a general way, the embryo passes through stages corresponding to those through which our species is believed to have evolved in past ages.

These three lines of evidence, together with the observed facts of the production of myriad varieties of domesticated animals and plants in just a few thousand years, constitute convincing proof that evolution really *has* occurred, and is still occurring.

CHAPTER II

THE EVOLUTION OF MAN

"All men living or who once lived, belong to the common Human Family, though divided from one another by time and space."

DIODORUS

c. 50 B.C.

WHEN FINALLY scientists became convinced that man, like other animals, had evolved from lower forms, they began to search about for fossil evidence. It was expected that remains would be found of types intermediate between modern man and his supposed ape-like ancestors, and that the older the remains were, the less human they would be, and the more simian or ape-like. At first these expectations were realised. In the Neanderthal gorge in Germany, and in many other places, skeletons were found that show definitely simian characters. "Neanderthal Man," as this type is called, had the very prominent continuous eye-ridge that the ape has; he had a flat bun-shaped top to his head, as the apes have; the shape of his thigh bones show that, like the ape, he did not stand fully erect; and he had only the tiniest suspicion of a chin. On the whole, he seemed to fit in with expectations.

The Neanderthal remains are estimated to be about two hundred thousand years old, and it seemed reasonable to expect that the remains that were disinterred near Heidelberg, from a sand deposit of about four hundred thousand years ago, would be even more simian. And, as a matter of fact, the jaw of the "Heidelberg Man" is found to be extremely heavy and massive, much more so than that of Neanderthal Man. It is probable

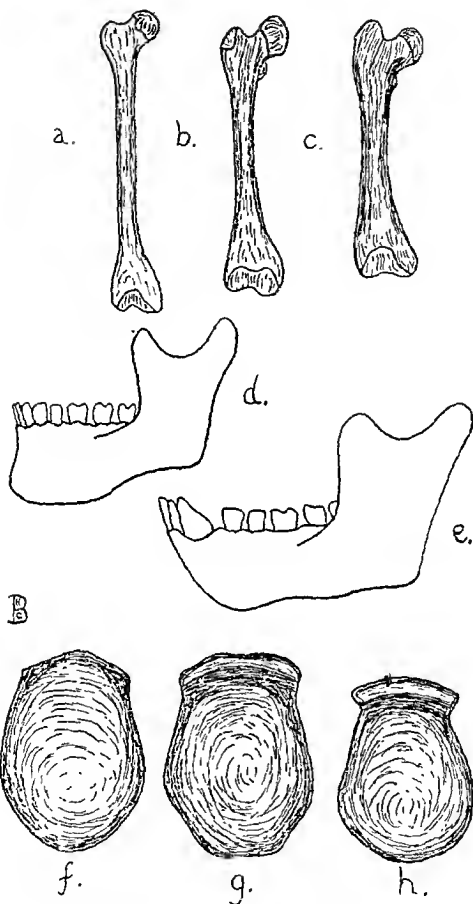


Fig. 1. (*a, b, c*) Thigh bones of Modern Man, Neanderthal Man, and Gorilla. Note the gradation in length, width, and straightness; (*d, e*) Lower Jaws of Modern Man and Piltdown Man. Note absence of a chin in the latter, and its greater massivity; (*f, g, h*) Skulls of Modern Man, Neanderthal Man, and Java Man, from above. Note prominent eye-ridges in the two latter.

that he also had a prominent continuous eye-ridge and a flattened head, and he had not even the trace of a chin. Heidelberg Man does in fact appear to be an even more primitive type than Neanderthal Man.

To find a still earlier representative of the "human" family, we go to Java. There, in a deposit laid down about 500,000 years ago, were found remains of immense interest. "Java Man," as one might expect, showed the simian features of prominent eye-ridges, flattened and bony skull, and chinless jaw.

So far all the facts have fitted in with our anticipation—namely, that the older a skeleton was, the more nearly it would approach to the ape. Now let us look at some of the difficulties. Firstly, Neanderthal Man had a larger brain and less ape-like teeth than ourselves. Secondly, Java Man appears from his thigh bone to have been completely erect, although the much later Man of Neanderthal was stooping. Evidently the idea of a simple straightforward evolution from Java Man, to Heidelberg Man, to Neanderthal Man, to our own species, will not explain all the facts.

Three other sets of human remains add to the complexity of the problem. Of two of them, "Pekin Man" and "Rhodesia Man," little can at present be said with any great certainty. But of the third, found in the gravel of the River Ouse, near Piltdown, a good deal is known. "Piltdown Man" was extremely simian in his jaw and skull, but, unlike the ape, he walked erect, and had no prominent eye-ridge. Once again we have a mixture of human and gorilloid characters that cannot be fitted into a straightforward evolutionary scheme.

Let us give up this attempt to make the facts fit a theory, and adopt the more scientific attitude of trying to find a theory to fit the facts. Here is such a theory. Some two million years ago, the humanoid type of being became differentiated from the simian. After perhaps another million years, Java Man was evolved, keeping most of the ape-like characters, but standing erect. When this species had been in existence about

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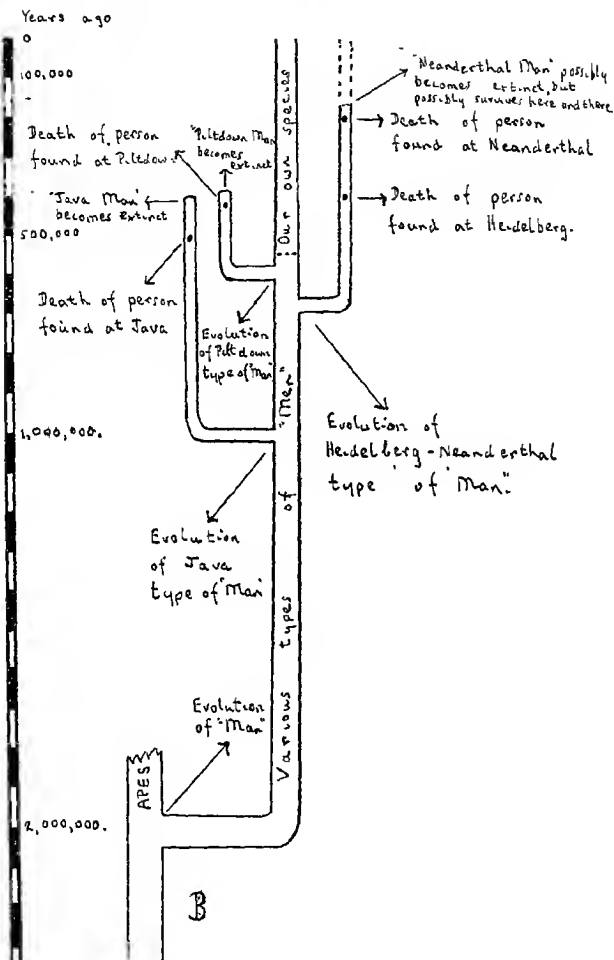


Fig. 2. Illustrating the evolution of Man. Should be examined in conjunction with pages 19 and 21.

half a million years (i.e. about half a million years ago) an individual's skeleton was incorporated in a river deposit in Java, to be found in the last century. He was called "Java Man" because of the location of that particular skeleton of which we know, but he may have had a world-wide distribution. Somewhat later than the evolution of Java Man, but before the birth of the particular individual of that species whose skull we happen to have, another type was evolved, still simian in many respects, but with a large brain and highly specialised teeth. An individual died at Heidelberg, and he is the type-specimen of "Heidelberg Man." This type continued in existence, and eventually acquired the trace of chin, thereby becoming what we call "Neanderthal Man." At about this time, too, another line of evolution was being traced out. Here the erect posture was gained, and also the great eye-ridge was lost, giving "Piltdown Man."

Thus by evolution in many diverging directions, these and other species of "men" came into existence, and it seems likely that our own species too was living at a quite early date. Between these species there would be competition, and eventually all but our own died out. This is a complicated story, but a simpler one cannot explain all the facts—it can only explain them away.

CHAPTER III

MAN AND HIS CULTURE

"... The disposition and manners of men are formed by their situation, and arise from the state of society in which they live."

W. ROBERTSON
1777.

"The materialist doctrine that men are products of circumstances and upbringing . . . forgets that circumstances are changed precisely by men."

K. MARX
1845.

THE PHYSICAL STRUCTURE OF MAN is much the same the world over. The negro may have a thicker lip, a broader nose, a darker pigment, and frizzier hair than the white man; the "Red Indian" may have an aquiline nose and hair like black thread; but these are only minor differences. The physical structure of man has been much the same for millennia. There have been round-headed folk and long-headed folk; there have been larger races and smaller; but a man of 5000 B.C., if clothed by Montague Burton, would probably walk through Liverpool's dock-land unnoticed. Man is a very sharply defined species.

But what is true of man's body is by no means true of his mental outlook and social organisation. There has never been a greater lie than "You can't change human nature." It requires but a cursory survey of the world to-day to see what a very variable thing human nature is. Can it be seriously contended that the "nature" of the last representative of the Tasmanian race, who died in 1877, was similar to that of the English settlers who were responsible for his death? Is it conceivable that a people whose only implements were made

of stone—and made badly, at that—whose main weapon was a simple wooden spear, and who did not know the use of pottery, could have had a mental outlook at all comparable with that of the European who lives in ferro-concrete houses, who uses pneumatic drills and oxy-acetylene flames, who kills in a more civilised way by machine-guns and poison-gas, and who buys his pottery at threepence a piece? Quite clearly there is a tremendous variability in “human nature.” The nature of the Iclander, like that of the Bedouin, is to offer hospitality to the traveller: the nature of the Brighton hotel-keeper is to offer him the bath to sleep in, and charge him ten shillings a night. If by “human nature” we mean, quite simply, “the nature of the human as he is,” then human nature can be changed, and changed most readily, and it is the environment, physical and social, that changes it. Nothing is more certain than that the new physical and social world that is being created in the U.S.S.R. is also creating a new type of human nature there.

If we were told, “You can’t change human instincts,” that would be a very different matter. The Andaman Islander and the modern European both feel the urge of sex, but they will express that urge in very different ways. Both feel the pang of hunger and the bite of wind, but they eat different foods and use different clothes. In fact, in the building of human nature, the inborn, hereditary part is much less important than is generally appreciated. If of two identical twins, one were brought up in the Congo forest and one in the London slums, they would certainly grow into very different adults, despite their identical inheritance. Our heritage, indeed, is of two parts—natural and nurtural. The natural heritage is that which the individual receives from the sex-cells of his parents, and determines whether he is blue-eyed or brown, snub-nosed or colour-blind. It is by controlling this heritage that the eugenists hope to improve the human race. But by far the more important heritage that we receive is the nurtural—that stock of customs, morals,

inventions, technical skill, and literary and artistic endeavour which has been accumulated by untold effort during many millennia. And this knowledge that has been accumulated, has been originated by comparatively few people. Nothing could be further from the truth than the prevalent idea that inventions come out of philosophic contemplation. Man does not normally make any advance at all, except when some very definite circumstance forces him to concentrate on a definite problem. The vast majority of mankind, even to-day, makes no contribution at all to our knowledge. Ninety-nine Englishmen out of a hundred learn from their parents how to blow their nose and part their hair; how to speak and what to say; what to do and what to believe—and all this without a moment's thought. They do not wonder why and how things happen, because they take them for granted. They make to the world's culture absolutely no original contribution. It is only the exceptional man, in exceptional circumstances, who realises that there are problems to be solved, and sets about solving them. When all this is borne in mind we can appreciate the intense conservatism of primitive societies, and can form some idea of the ages that must have elapsed since man first thought of making implements of stone. And having realised that in the evolution of culture there is a tremendous problem involved, one can set about the attempt to solve it. We can choose between three solutions.

The first of these is not a scientific but a theological explanation. Man progresses, we are told, because he is under the guidance of a loving God. Since this God is also said to be omnipotent, there is clearly no obstacle which He cannot overcome, and no apparent set-back which is not part of the Divine Plan. Civilisations prosper when man is religious, and when he lapses, become one with Nineveh and Tyre.

The second solution is one that dominated many very fine minds for a considerable period—and indeed still does so. There is in man, they say, an "innate tendency

to progress." The fact that man's culture has gone through approximately the same stages the world over was taken as evidence of such a tendency. But history shows one thing most clearly—it shows that time and again civilisations have reached a very high level, only to relapse once more to barbarism. This "innate tendency to progress" is evidently a very unreliable tendency, and probably is but a fiction. Support has been claimed for this theory from the theory of evolution. Will not our society evolve, and will not our minds evolve, as we have evolved from the ape-men? But analogies are dangerous things. It sounds very well to say, "Plants and animals evolve, will not Society evolve also?"—but it does not mean very much. A society is not a living thing in an external environment. It is a complex of living beings, whose actions are determined by their genetic heritage and by their environment, and it "evolves" only in a very metaphorical sense.

Let us get down to realities. If the environment determines men's actions, then we must look for an explanation of past changes in society, in past changes of the environment. What such changes are most likely to have influenced man? Primitive man had first of all to provide himself with food. Food is either plant or animal, and the type of plant or animal which can exist at any given time and place is determined mainly by the climate, and secondly by the social organisation of the inhabitants. All else—clothing, shelter, the development of art—is subsidiary to the matter of food, and, since climate is an important factor in determining the available food supply, we must look to past changes of climate for one cause of change of culture. But climatic changes are not the only causes of cultural change. Once a society is in existence it acquires a momentum of its own, which carries it on either to further progress or to destruction. In addition to looking for past climatic changes, then, we must examine the social and economic structures of past societies for the full explanation of mankind's cultural "evolution."

CHAPTER IV

THE EARLIEST CULTURES

C. 2,000,000 TO 105,000 YEARS AGO

"It is hardly too much to say that Civilisation, being a process of long and complex growth, can only be thoroughly understood when studied throughout its entire range; that the past is continually needed to explain the present, and the whole to explain the part."

E. B. TYLOR

TRYING TO TRACE out Man's early history is like trying to trace out one's own genealogical tree. Fairly definite evidence will take us back a few generations, but then matters become rather hazy. Until recently archaeologists thought that there was no evidence of the existence of man before the Pleistocene period (i.e. about the last 400,000 years), but work that is being carried out upon the crags of East Anglia is gradually persuading them that man lived in much earlier times. Flints known as "Eoliths"¹ have been found in the deposits of these early times and many people believe that they have been made by human agency. No human remains have been found associated with these eoliths, but some of them are of approximately the same age as Java Man, and *may* have been fashioned by his fellows. At this time a land bridge connected Europe and Africa, and migration across what is now the Mediterranean Sea would be quite easy. Species of rhinoceros such as now exist in Sumatra, elephants, hyænas, monkeys, and the extinct sabre-toothed tiger all inhabited Europe. The flora was equally strange. In addition to the ordinary present-day

¹ "Eolith" means "dawn-stone."

European deciduous trees, there used to grow the locust-tree, the sweet-gum, the bay-tree and many other exotic plants.

But gradually the climate worsened, and the warmth-loving species, both plant and animal, began to leave Western Europe, although they might linger on here and there in specially favourable situations. Eventually an ice age supervened, and over a vast area any high form of life must have been quite out of the question. From rocks of rather later date, some very simple implements known as "Strepyan"¹ flints have been obtained. They consist mainly of naturally shaped stones which have been retouched by man, so as to give a firm hold and a sharp point or edge. What type of man was responsible for this retouching? Here, as in almost every single problem of prehistory, there is a difference of opinion. But at about this time, both Heidelberg Man and Piltdown Man were in existence, and possibly our own species too, and any or all of these may have fashioned the Strepyan flints. These flints are found in Spain, France, Belgium, and Great Britain, but not in Central Europe, which seems to indicate that they derive from North Africa, probably via the then land bridge of Gibraltar. At this period also simple "Icenian" flakes were used, and "Darmsdenian"² implements were made by chipping pebbles.

In still later deposits the more elaborate implements known as "Chellean"³ are found. The crude chipped nodules of Strepyan type have been vastly bettered. By continued flaking, the core of stone remaining is shaped in various ways—almond shaped, pointed or oval. Such implements are known as "coups-de-poing" or "hand-stones," and gradually improve in workmanship as more recent deposits are examined. The people who used them lived mainly in the open as hunters, but we know little else about them. In addition to the typical core-implements *left* after flakes had been chipped off from a

¹ Named after the place Strepy.

² First found at Darmsden.

³ First found at Chelles.

lump of flint, some implements have been found, especially in the neighbourhood of Cromer and Clacton-on-Sea, which actually *consist* of detached flakes. These are "Cromerian" and "Clactonian" flakes.

After thousands of years during which the ice returned, bringing with it an arctic flora and fauna, a new type of tool known as the "Acheulian"¹ was invented. Here the coup-de-poing is developed into a much finer and more symmetrical instrument, with straight, convex, or concave edges, finished off by careful secondary flaking—altogether a daintier implement than those fashioned in Chellean times. Just as in the Chellean period, some implements were made of flakes, particularly near Levallois, and these "Levalloisian" flakes became more numerous towards the end of the period. The Acheulian implements appear to have been made mainly by Neanderthal Man, who is thus seen to have developed to a considerable extent the human attribute of intelligent fashioning and use of tools. The Acheulian Neanderthals must have hunted for their food, and yet not one of his implements has been found that is undeniably a weapon. This leads some archæologists to believe that he hunted, like the modern Tasmanians, with spears made exclusively of wood, which decays easily.

In more recent deposits than those in which the Acheulian implements occur, an entirely different type, also made by Neanderthal Man, is found. These "Mousterian"² flints appear to be a development of the flake-implements which occur occasionally in Strepyan and Chellean times, and were very carefully worked. There is some doubt about the climate of the Mousterian period. On the one hand there are plentiful remains of the woolly mammoth and the woolly rhinoceros, with reindeer, arctic hare, arctic fox, and arctic ptarmigan—all indicative of cold conditions; but on the other hand there are the remains of a very large cave-lion and cave-hyæna—

¹ First found at St. Acheul.

² First found at Le Moustier.

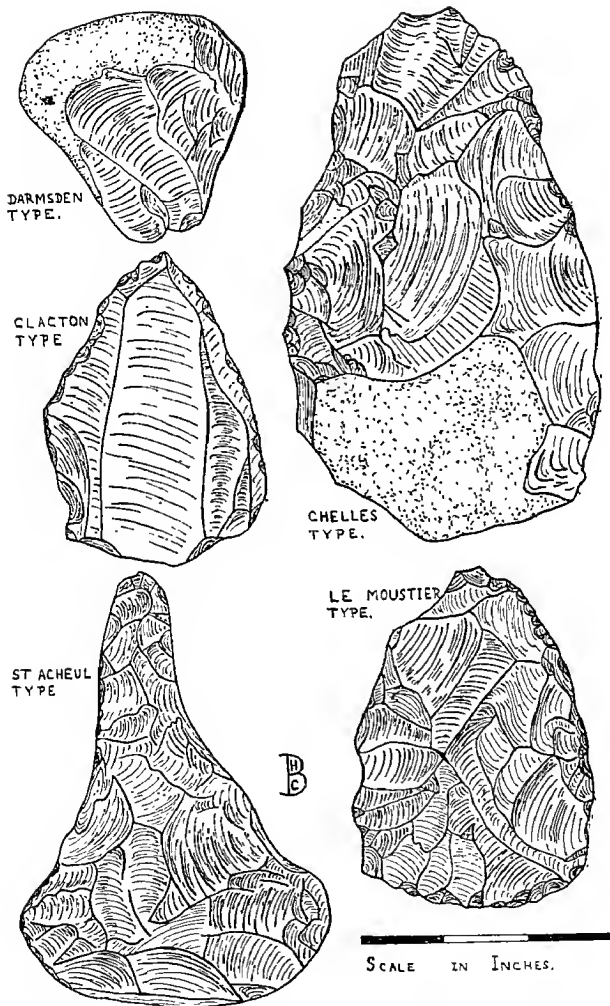


Fig. 3. Very early types of stone implements.

species that one usually associates with warmer climes. It is likely, however, that many of these so-called "warmth-loving" animals can in fact put up with quite considerable cold, provided that there is plenty of food available. Further evidence for a cold Mousterian climate is the fact that stomachs of frozen mammoths dug up from the arctic ice have been found to contain plants such as now grow on the North Siberian meadows. But the Mousterian culture lasted over some thirty-five thousand years, and this is ample time for there to have been considerable change of climate. Such a change of climate would explain the fact that whereas at first the Mousterians lived in the open, they later took possession of many of the rock-shelters previously occupied by lions, bears, and hyænas. Possibly the Mousterian culture was first developed during a fairly cold period, lasted through a warm interglacial period, and then once more had to cope with an ice age.

It appears that in these early settlements of Europe there were two distinct civilisations—the one using core-implements, and the other flakes. If maps be drawn, one showing the distribution of the very early cores, and one showing that of the very early flakes, it is seen that the former spreads through Spain and the North African coast, while the latter spreads over Central Europe to the East. This seems to indicate that the core-civilisation entered Europe from Africa, while the flake-civilisation came from Asia, and that the twain mingled in England and in France. But if a map is drawn of the later Mousterian flakes, they are seen to occupy the territory previously belonging to the core-civilisation alone. Possibly the increasing cold of the Mousterian period drove the users of the cores (perhaps forest dwellers) from Europe and led to their replacement by the flake-users, who probably dwelt on steppes.

The common feature of the cultures so far considered—whether dominated by pebbles, by flakes, or by cores—is that they were all the product of alien species of man. "*Homo sapiens*," the species to which we

belong. They have been in existence, but was of little importance in Western Europe. For this reason these cultures are grouped as an "Age of Early Men " or the "Palæanthropic Age."

CHAPTER V

THE AGE OF THE REINDEER

C. 95,000 TO 10,000 YEARS AGO

"Man's first arms were hands, nails and teeth and stones and boughs broken off from the forests, and flame and fire as soon as they had become known."

LUCRETIVS

C. 50 B.C.

IT IS NOT KNOWN with any certainty where exactly our species was evolved. Some contend that his cradle was in Africa, others in America, and yet others in Central Asia, and each protagonist can produce evidence in favour of his view. But one thing is crystal clear. It is that after the ice age which set in at the end of the Mousterian period, our species suddenly became dominant the world over. The culture immediately following the Mousterian is known as the "Aurignacian,"¹ and Aurignacian stations have been found in England and Wales, in France, in Spain, in Italy, in Central and Eastern Europe, in Northern and Eastern Africa, and even in Siberia, India, and China. This extremely sudden achievement of dominance leads one to believe that our species was already in existence, and that after the Mousterian ice age his superior brain-power enabled him rapidly to become dominant, with consequent extinction of Neanderthal Man.²

In favour of the idea of the antiquity of our species,

¹ First found at Aurignac. The term is used here to include the Capsian culture of Africa.

² It seems possible that some remnants of the species have survived in isolated parts.

is the fact that already, even in early Aurignacian times, it was differentiated into at least two distinct races. One of these, "Crô-Magnon Man," was a magnificent figure, varying in height between 5' 10" and 6' 4", with an average of about 6' 1½". His legs were longer in proportion to his arms than are our own, and his lower leg was longer in proportion to his thigh. His head was long, his face was broad and short, and his nose was long and narrow. But he was not merely a "magnificent beast." Not only his body, but his brain was larger than ours. Indeed, the average cranial capacity of Crô-Magnon woman was greater than that of modern man. Of course, the size of the brain cannot be taken as a direct indication of mental ability, but they are in some way connected.

The civilisation of the Aurignacian races was totally different from that of their Neanderthal precursors. There were still a few flake and core implements in use in the very early stages, but very quickly these were displaced by an entirely new type of implement—the "blade." This consists of a long flake which has been sharpened along one edge, and deliberately blunted, presumably for convenience of holding, by secondary flaking along the other. The resulting tool is very similar to a modern knife-blade, and is extraordinarily effective. The Aurignacians had other tools. They made "burins" or gravers (sharp-pointed tools, often rather like a fine screw-driver) which were used to make incisions in hard materials, such as rock or bone. They also shaped flints for scraping animal pelts. Indeed, at the peak of their development, they had a group of tools of which we might almost ourselves be proud. Awls, spoke-shaves, drills, skewers, spear-heads, and bodkins have all been preserved in either stone or bone, and we cannot say what they may not have made of more perishable materials. It seems probable that they would wear fur garments, collect in baskets of osiers, and hunt with bow and arrow—and indeed some contemporary Spanish wall-paintings depict all these things. But Aurignacian

man did not live by bread alone. He has left behind him evidence of primitive religion and a love of decoration. Sea-shells, fish-bones, teeth of reindeer and wolf, and lumps of polished ivory, have all been found pierced, evidently for suspension on the body. Even beads have been found, beautifully made from ivory, and some of them no larger than one-twelfth of an inch in diameter.

The Aurignacians evidently had time to devote to the pursuit of cultural interests, probably because they were living in a period of temporary retreat of the ice. The climate was still cold, but was very dry: the reindeer became comparatively rare in Southern Europe, but the bison, the horse, the red deer, the lion and the hyæna were abundant. So there was no shortage of food. Indeed, at one place there has been found a pile of horse-bones, some hundred yards long, and about ten feet deep—refuse of many feasts. With this leisure at their disposal, Aurignacian men developed an amazing culture. They carved animals in stone, and they engraved them on stone and bone—and magnificent engravings they are. But not only did they engrave and carve: deep down in the inaccessible recesses of dark caves, on the roof and on the walls, they painted the animals that they hunted. At first simple outlines, they develop in later times into bold and vigorous representations that cannot help but thrill. A very strange problem here presents itself. Why did they choose such out-of-the-way places? Why should they paint deep down in the earth, where often there was not room to stand? An artist does not normally choose such a canvas. We can never know for certain, but many archæologists believe that this art was not merely due to a desire for self-expression, but was developed in connection with religious ceremonies which were conducted in these grottoes. There is considerable evidence for this point of view. For example, some of the earliest sculpture known consists of small carved female figures, often in a highly conventional style. There is nothing outstanding in this: but what is significant is the fact that the women depicted are

almost invariably quite obviously pregnant—which is suspiciously reminiscent of the fertility-cults so common among backward races to-day. Supporting this view is the fact that there has also been found an image of a phallus carved in bison horn, and also representations of the female sexual organs. Even more striking are the imprints of human hands that are often found on the walls of caves. These hands had evidently been curiously and horribly mutilated—parts of one or all the fingers having been amputated. What can be the explanation of this revolting custom? The practices of modern races may throw some light on it. The Californians, the South African Bushmen, some Red Indian and Eskimo tribes, and the Dravidians of Mysore, all mutilate their hands in this way. In some cases it is an act of repentance, in others one of mourning, in yet others it is one of rejoicing at the birth of a child. But in all cases it is connected in some way with magico-religious belief. But there is even more direct evidence of some such motive in Aurignacian society. On the wall of one cave, in a most inaccessible position, is the portrait of what is obviously a sorcerer. He has human legs, a horse's tail, the arms of a bear, the face of an owl, a long beard, and the horns of a stag. It is impossible to look on this representation without being convinced that it is connected with some magical ceremony.

In short, we may say that Aurignacian man was very much like ourselves. He fashioned implements to meet his needs; he made dwellings of wood and skin; he wore clothes of skin and fur; he developed the arts of sculpture, engraving, and painting; and he had definite religious beliefs.

The next stage in the development of human culture, known as the "Solutrean"¹ stage, is a rather puzzling one. Whereas the known Aurignacian stations range all over Europe and North Africa, the Solutreans were rather limited in their range and kept entirely to the plains. It seems likely that they were a conquering race

¹ First found at Solutré.

who were able to overcome the earlier inhabitants by means of the possession of superior instruments of war. Certainly the Solutreans developed the art of tool-making to a perfection that was hardly ever reached again. They developed an entirely new technique. Instead of shaping the flint solely by means of sharp *blows*, they did all the fine flaking by the application of *pressure*, and this led to the development of far more delicate work. It is impossible to describe these perfect tools and weapons at all adequately—they can be appreciated only by a study of actual specimens or, at second-best, of diagrams. But despite this magnificent flint-technique, the Solutreans appear to have had little artistic ability. It is possible, of course, that the very dry climate of these times, producing the vast deposits of dust or “loess” in which many Solutrean implements are found, would lead to a much more out-of-door life—and any paintings out-of-doors would not last like those in the depths of caves. But even taking this into account, there seems no doubt that the Solutreans were much less artistic than the earlier Aurignacian Crô-Magnons, or else were so occupied with flint-shaping that they had no time to spare for painting.

A great deal of confusion has been caused by the common habit of speaking of an “Aurignacian Age,” a “Solutrean Age,” and so on, as if, at a definite period in time, mankind the whole world over changed from one type of culture to another. Nothing could be further from the truth. When the population of France and Central Europe had passed to the so-called “Solutrean Age,” the people of Italy and Spain, where the Solutrean culture never penetrated, were still in the “Aurignacian Age.” Then a new culture, the “Magdalenian,” was developed in parts of France and Great Britain, but did not spread very far. Thus when the people of France had passed on to the “Magdalenian Age,” those of Central Europe were still in the “Solutrean Age,” and those of Italy and Spain still in the “Aurignacian Age.” Clearly it is quite impermissible to use the word “age” at all in

this connection unless it is limited in its application to a definite prescribed area.

The Magdalenian period (i.e. the period during which implements of the type found at La Madeleine were in common use in France) constitutes a wonderful chapter in the history of mankind. The artistic talent which was so evident among the Aurignacians, but which seems to have waned among the Solutreans, now flowers to perfection. Deep in caves are found incredibly fine painted representations of bison, horse, deer, reindeer, roe-buck, lion, mammoth, elephant, rhinoceros, and indeed of virtually all the animals with which Magdalenian man came into contact. At first they were in one colour, and often quite excellent relief was obtained by shading; later a combination of engraving and flat-wash was developed; and finally polychromes which probably not one man in a thousand could execute to-day, even after professional training. By what technique were these works of art created? There is much more evidence available on this point than one might expect. Stopped-up hollow bones containing the pigments have been preserved, and even an actual palette with daubs of colour. For black, bones were burned and then ground up, but works in this medium were rather fugitive. A more lasting dark pigment was obtained by grinding black manganese oxide; and yellows and browns and reds by the grinding of iron ores. The powders obtained were mixed with animal fats, and formed what was virtually an extremely heavy and stiff oil-medium. But the apparent crudity of the pigments is by no means reflected in the paintings. Browns and reds and yellows are so worked into one another as to give a wonderful representation of the beast depicted, and one glowing with life and warmth.

It is impossible to view the more remote examples without artificial light, and since Magdalenian man painted them deep down in the caves, he must have had artificial light too. But the walls and roofs show no signs of blackening, so that his illumination was not just a torch, but a properly fabricated lamp. Indeed, there has

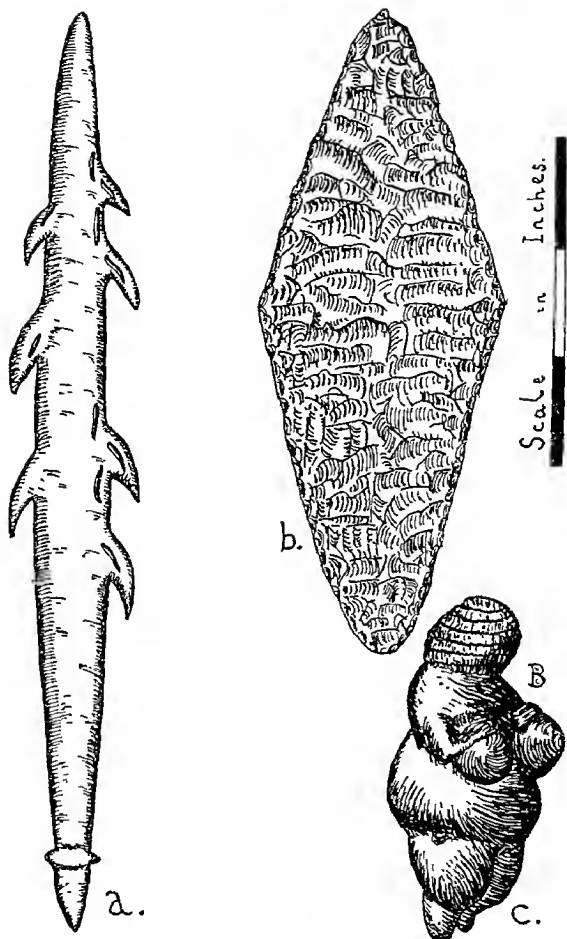


Fig. 4. (a) Magdalenian bone "harpoon"; (b) Solutrean flint implement; (c) Aurignacian figurine. The scale applies only to (a) and (b).

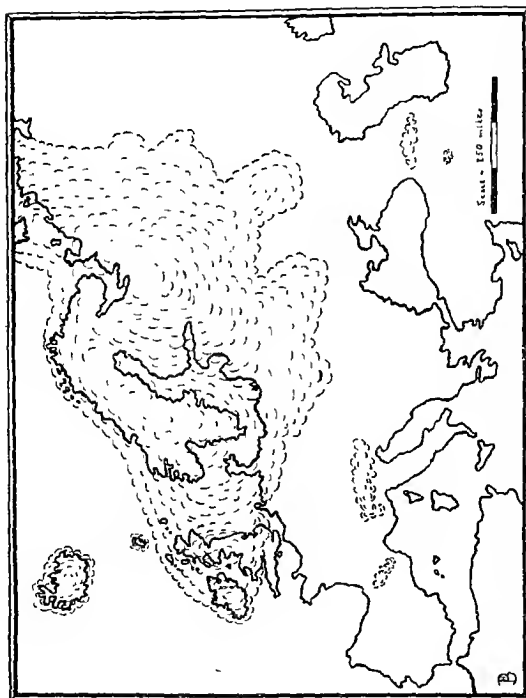


Fig. 5. Showing maximum extent of glaciation of Europe. Present coast line in deep black; ice-covered areas shaded.

been found a Magdalenian lamp of stone, not at all unlike those which Eskimos use to-day. This is not the only resemblance between the Magdalenian "Frenchman" and the modern Eskimo. The climate of Europe in Magdalenian times was cold and icy, as is that of the Eskimo hunting-grounds to-day, and their lives must have been very similar. Like the Eskimo, the Magdalenian lived very largely on fish. His flint implements were very much poorer than those of the Solutreans, but he developed to perfection implements of bone, horn, antler, and ivory. In the earlier stages, bone lance-points were common and soon we come across so-called "harpoons"¹—at first quite simple, but later developing a single, and then a double row of barbs. The Magdalenians also had bone or ivory spear-throwers and arrow-straighteners, often engraved or sculptured just as are those of the Eskimo to-day; and had beautifully made bone awls, pins, fish-hooks, bodkins, whistles, and even delicate needles no more than one and a half inches long, which indicate that they must have been very fastidious in their sewing and embroidery. Even in their personal adornments, such as hair-pins, the women of the Magdalenian period had Eskimo-like taste. These remains make it quite clear that the civilisation of these times was of a quite high order—and it must be realised that bone, stone, and horn are the only materials that survive to give direct evidence of their use. But there is indirect evidence of the use of other materials. The presence of bone needles means that clothes were sewn, and, judging by the delicacy of some of the needles, sewn very finely at that. The presence of bone-points far too small to have been used alone indicates that they were probably used as arrow-heads—the wooden bow and shaft having long ago decayed; and this supposition is strengthened by the occurrence of bone implements very similar to those which present-day Eskimos use to straighten their arrows. The only habitations which were

¹ There is no certainty that they were actually used as harpoons. They may have been fish-spears or bird-catchers.

certainly frequented are caves, but it seems very likely, judging from certain highly conventionalised drawings, that huts and tents were also in common use.

What type of people were these Magdalenians? It seems certain that they consisted of at least two distinct races. One was of the Crô-Magnon type, which had been dominant in Aurignacian times; had then been conquered by the Solutrean race; and had once again achieved eminence. The other is known as the "Chancelade" race, and had a large brain, a long head, a long and narrow nose, and a long palate—all characteristics which are shared by some modern Eskimos. It has been suggested that these two races used to share the tundra region of Europe, much as did the Eskimo and the Red Indians that of North America, in historical times. It is a very significant fact that the present-day population of the Dordogne region of France, where most of the Magdalenian industries have been found, are definitely of the Crô-Magnon anatomical type—and it is difficult to avoid the conclusion that they are actually living representatives of the Crô-Magnon race. The same may be said of the Landes district of France, of certain islands off the coast of Holland, and of Brittany, where in places, as large a fraction as one-third of the population is of this type. These four places are all fairly near what was the centre of the Magdalenian civilisation, and it is quite easy to believe that Crô-Magnons are still living there. But there is one other case that is much more startling. Before the Western European nations set out on those historical conquests which have enslaved so many peoples, and totally destroyed so many others, the Canary Islands were inhabited by a race known as the "Guanches." These Guanches were a strange race to be inhabiting the Canaries. They were fair-skinned; they had fair hair; they had the unusual combination of long head and wide face; and they were a huge race, the smallest men being not less than 5' 7" in height, and the largest ranging up to 6' 6½". In all these characters they resemble

COLD	MAGDALENIAN		
COOL	SOLUTREAN		
	AURIGNACIAN		
COLD	MOUSTERIAN		
WARM	LEVALLOISIAN		
COLD		ACHEULIAN	
WARM	CLACTONIAN		
COLD		CHELLEAN	
WARM	CROMERIAN		
COLD	NO CULTURES KNOWN		
WARM	ICENIAN	DARMSDENIAN	STREPYAN
?	EOLITHS		

Fig. 6. Table showing sequence of cultures, with probable climates. Read from base upwards.

Crô-Magnon man. But, apart from anatomical, there are also cultural resemblances. The Guanches, like the Magdalenians, did not polish their stone implements. They used wooden swords and shields, and had lamps of hollowed stone. But, most surprising of all, they lived in caves, and painted in them. How else can we explain the fact that a race of Crô-Magnon anatomy, with implements of Magdalenian type, was actually living and painting in historic times in caves in the sunny and fertile Canary Islands, except by assuming that the Guanches were living relics of Magdalenian Crô-Magnon man, who had retained parts of their once magnificent culture? So much for Magdalenian Crô-Magnon man. What of Magdalenian Chancelade man? Has he also survived? Opinion is divided, but it does seem quite possible that towards the end of the Magdalenian period, when the climate was becoming less severe, and the reindeer was retreating north, the hunter of the reindeer would go north too, and may be represented to-day by some Eskimo tribes.

These three early cultures of our own species—the Aurignacian, the Solutrean, and the Magdalenian—are grouped together as the “Palæolithic” or “Old Stone Age.”

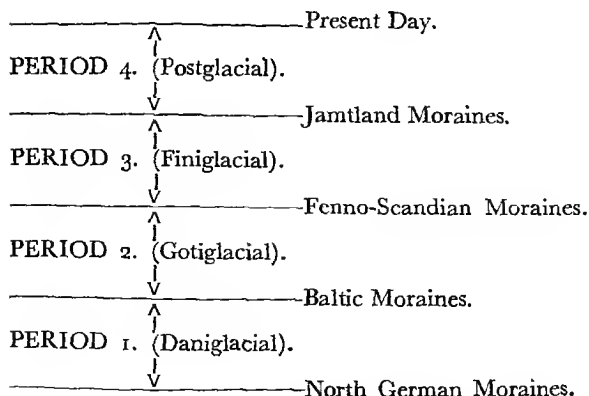
CHAPTER VI

EUROPE AFTER THE LAST ICE AGE

WE HAVE SEEN how in the course of many thousands of years, the Strepynan, Chellean, Acheulian, and Mousterian cultures were developed by species of man which are now extinct, and how they were followed by the Aurignacian, Solutrean, and Magdalenian cultures of our own species. And it will be remembered that during the ages in which these cultures were developed there had been great climatic changes. There had been ice ages, and between the ice ages the climate of Europe had been as warm as parts of the tropics are to-day. Comparatively little is known about the conditions of these early days, for each ice sheet largely obliterated the records of the preceding period. But of the times since the maximum of the last ice age we have very considerable knowledge.

When a glacier melts, all the rocks and earthy material which it has borne are deposited near its edge. These rocks accumulate, and form a "moraine" or hillock, which is recognisable even after many years, and is a permanent record of the position of the edge of the glacier, long after the glacier itself has disappeared. As the climate changed, at the end of the last ice age, the ice sheets melted and left a line of moraines in North Germany. The receding ice gradually uncovered North Germany and Denmark—and because it freed Denmark, this is called the "Daniglacial" recession. There was then a halt in the contraction of the ice, and a new line

of moraines was formed in the Baltic region, at the melting southern edge of the ice. Once more the ice began to retreat, and this time the Isle of Gotland was uncovered, so that this recession is called the "Gotiglacial." When this period of retreat came to an end, yet another line of moraines was formed on the edge of the ice sheet, and these are known as the "Fenno-Scandian" moraines. Twice so far the ice has retreated, and twice come to rest. Now again it recedes still further, and during this "Finiglacial" recession uncovers the greater part of Finland; and then for the last time it comes to rest and deposits moraines in Jamtland. Since then it has continued to retreat. This last recession the Scandinavians call the "Postglacial." This recital of events may seem rather complex. But, even if complex, it is an extremely important recital. It is important because man could only settle in Northern Europe after it had been freed from ice, and so the position of any remains of habitation enable us to give a maximum age to those remains. Thus we can divide up the period since the maximum extension of the last ice age into *four* main phases, as follows:



We have spoken so far of the ice "retreating." Whither did it retreat? It must have gone somewhere—it is not all piled up at the North Pole to-day. The answer is, of course, that as it melted, most of the melt-water would go into the sea. Now the ice sheet of the northern hemisphere covered at one time some four hundred and ninety thousand square miles. Taking the ice to have been on the average about three thousand feet in thickness, its melting would have liberated enough water to have raised the sea-level all over the world by some two hundred feet! Is there any evidence to support this rather startling calculation? There is. Right in the middle of the North Sea, on the Dogger Bank. Fishermen bring up in their dredges from time to time large lumps of what they call "moor-log." This is in fact peat, containing the remains of insects and plants that usually live on fens and marshes. Yet this peat, formed above sea-level, is now some one hundred and forty feet below it! There is other evidence round our shores. On the fore-shore at Leasowe, at Formby, at Rhyl and at Abergele, in the Dovey Estuary and around Ireland and the Isles of Anglesey and Man, there are "submerged forests." These are beds of peat, often with hundreds of tree stools and trunks, which lie between tide-levels, and are exposed at low tides. Quite clearly they did not grow under those conditions. Massive oaks and pines cannot live and thrive if they are covered over by salt water twice a day. The local inhabitants may tell you that they are "relics of Noah's Flood"—which is a very pretty fairy tale. In fact, it seems that these forests grew above sea-level, and were gradually overwhelmed when the level of the sea rose, as the ice melted into it.

It is clear enough that as the ice melted, the level of the sea would rise, and old land-surfaces would be covered by the sea. But how are we to explain the fact that on the coasts of Scotland, the Isle of Man, Ireland, and Scandinavia, there are old land-surfaces known as "raised-beaches"—not *below* the present level of the sea, but *above* it? It seems as if here the sea-level must

have fallen—or else, what comes to much the same thing as far as we are concerned, the land must have risen. This apparent contradiction can be very easily explained. The surface layers of the earth are supposed to be floating on a less solid interior—just like a boat on a lake. Suppose that the boat is heavily loaded with ice, and that the ice gradually melts. Then the amount of water in the lake will be greater, and the water-level will rise slightly around the edges of the lake, and some of the moss growing on the edges may be submerged. This is what has happened in the case of the moor-log and the submerged forests referred to above. The water-level will, of course, rise round the boat also, but the boat will be more buoyant since it no longer bears the heavy load of ice, and the net effect will be that it *rises* out of the water. This is what has happened in the case of the raised-beaches.

One would expect the rise of land-level due to lightening of the ice-burden to be the more important where the load had been heaviest, whereas the rise of sea-level due to the melt-water would be much the same the whole world over. Therefore well away from the centre of the old northern ice-sheet (e.g. South England, Normandy, etc.) one would expect to find submerged forests, while near to the centre (e.g. Scotland, Scandinavia, etc.) one would expect the land-rise to have overcome the sea-rise, and to have produced raised-beaches—and this is in fact what we do find.

Can these changes in the relative land-sea level give us any detailed information as to the condition of Europe in postglacial times? In one particular case, namely that of the Baltic Sea, they can give us very considerable information. During the early retreat of the ice, the land at the south-western part of the Baltic area stood relatively higher than it is now, so that this outlet to the North Sea was blocked. To the north, the land was below water-level, but here there was the great ice-sheet blocking the exit to the Arctic, and so at this time the Baltic area was not a "Baltic Sea" at all, but a "Baltic

Ice-Dammed Lake." Eventually the retreat of the ice left open a gap at the northern end of the Baltic, and so the ice-dammed lake became converted into a sea—open to the cold sea-water of the north. This meant that instead of the organisms which were previously abundant, others which thrived in cold, salt water, took their place. It is by studying the remains of such organisms that the history of the Baltic area has been made out. Among the new inhabitants of these waters was one called *Yoldia arctica*, and, after this insignificant mollusc, the then sea is called the "Yoldia Sea." All this time the ice was retreating, and contradictory rises of sea-level and of land-level were taking place. Nearer the ice-sheet, where the Yoldia Sea joined the arctic waters, the land-rise was the more effective, and eventually the land rose right above the water in the north, and once again the Baltic region was a lake, but this time enclosed by land at both ends, instead of by ice at one end and land at the other. This meant, of course, that the organisms which thrived in salt water would die out, and others, adapted to fresh water, would take their place. Among these was one called *Ancylus fluviatilis*, and, after it, the Baltic lake of the period is called the "Ancyly Lake." This region seems so far to have had a very adventurous history, but it is not yet finished. The North Sea waters were rising with the continued melting of the ice, and so were those inside the Ancyly Lake, and eventually these two united, breaking through the land-bridge enclosing the lake on the south, and converting the Ancyly Lake into a deep sea, which contained the periwinkle *Littorina litorea*, and which is therefore called the "Littorina Sea." Since then quite gradual changes in relative land-sea level have modified the geography of the Baltic region to what it is to-day.

After an apparently pointless recountal of the history of the retreat of the Scandinavian ice, we found that it could be made to illuminate the object of our study—the history of man. Can the same be said of the equally complex history of the Baltic Sea? It can, and the

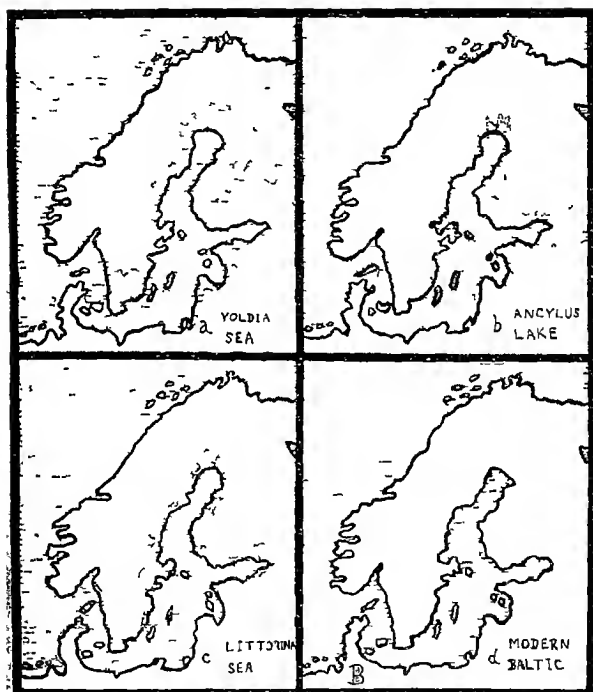


Fig. 7. Stages in the history of the Baltic. Modern coast-line deep black, water shaded.

illumination given is perhaps even brighter. Thus, if all the finds of a particular culture are mapped, and it is found that in practically all cases they lie along the strand-lines which have been left by the Littorina Sea, it is not unreasonable to suppose that they date from this period. On the other hand, if all the locations of a different culture are found to lie at a lower level than this strand-line, we can be fairly certain that they are more recent than the Littorina Sea, since otherwise they would have been washed away. And so just as the retreat of the Scandinavian ice-sheet gave us a means of splitting up the time since the maximum of the last ice-age, so does the history of the Baltic, and once again we have four periods.

—————Formation of modern Baltic Sea.

PERIOD 4. (Littorina Sea).

—————Junction of North Sea and Ancylus Lake.

PERIOD 3. (Ancylus Lake).

—————Yoldia Sea cut off from arctic waters.

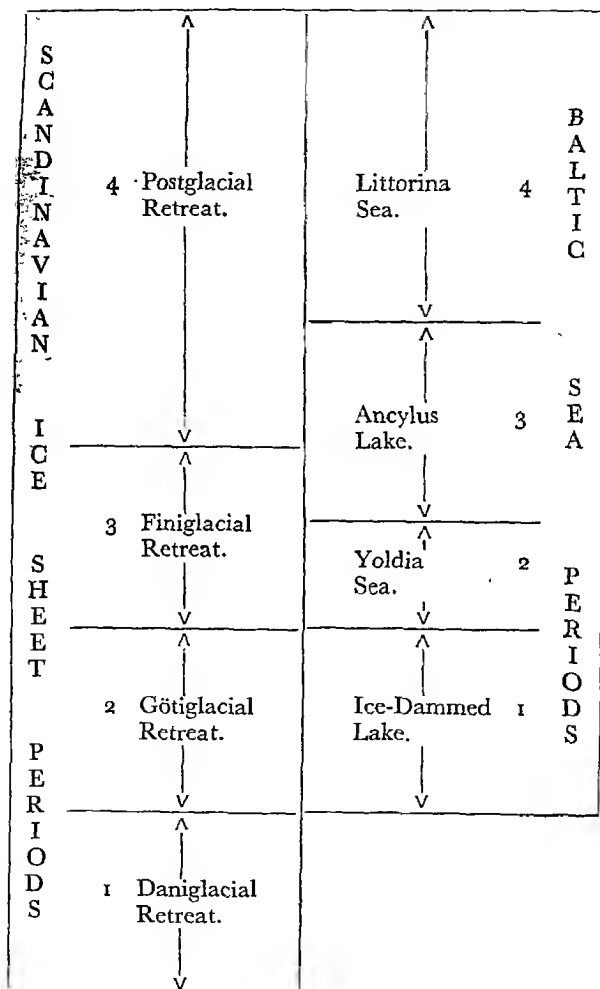
PERIOD 2. (Yoldia Sea).

—————Ice-Dammed Lake opened to arctic waters.

PERIOD 1. (Ice-Dammed Lake).

—————Retreating ice-sheet blocks northern exit.

Now we have two ways of dividing the period under discussion—one set of four periods from the history of the Scandinavian ice: one set of four periods from the history of the Baltic Sea. Is it possible to compare these two calendars, and to correlate the one with the other? As a matter of fact, this has been done and it is found that the Daniglacial Period was completed before the formation of the Ice-Dammed Lake; that the duration of the Ice-Dammed Lake corresponds roughly with the Gotiglacial Period; that the Yoldia Sea was in existence in the early days of the Finiglacial retreat; that the Ancylus Lake existed during the later Finiglacial and the earlier Post-glacial periods; and that the Littorina Sea corresponded with the later part of the Postglacial retreat. This correlation is shown below:



We have seen how it appears quite probable that Magdalenian man used wood for sledges, but no sledge has been preserved to us. He probably used wood for bows and arrows, but none have ever been found. Wood, indeed, is one of the least durable of all the commoner tool materials. And when we endeavour to find out what sort of trees were in existence at any particular time, we find the same difficulty. They have fallen and decayed away. But there is one type of habitat in which wood is preserved—it is preserved in peat. Walk over the Welsh Hills, and dig in the peat, and you will find pieces of birch and pine and alder that have lain there for thousands of years. Dig in the Irish Bogs, and you will find still more. But, best of all, dig in the deep peat beds of Sweden and parts of Germany. At the very base, in the first peat to be formed after the retreat of the ice, or in the silt underlying this peat, are found remains of the dwarf birch and willow, such as grow to-day in Iceland. At this time the climate was evidently not quite arctic, but was very nearly so, and it is known as the "Subarctic Period." The peat above this is not all of one kind, but is in layers—one layer might be formed of bog-moss, one of sedges, one of birch and pine, one of oak, one of alder, and so on. By examining these layers Continental geologists and botanists have been able to work out the changes in climate that have occurred. It seems likely that after the Arctic and Subarctic periods mentioned above, there was a rise of summer temperature from an average of about 8° Centigrade to an average of about 12° Centigrade. Just 4°—but 4° can make a lot of difference. In this so-called "Preboreal" Period, birch, pine, and willow were the only common forest trees. The temperature continued rising, and, in the succeeding "Boreal" Period, its summer average rose finally to about 16° Centigrade, and the dry climate caused a very great development of the pine and birch. But there was an onset of much damper conditions and in this damp, warm, "Atlantic" Period the oak, elm,

lime, and alder became generally much more important than the pine and birch. These Atlantic times lasted some two thousand five hundred years, and then the climate became colder and drier in what is known as the "Subboreal" Period. Peat only forms if the climate is fairly damp, and so the top part of the peat formed during Atlantic times became hardened, and formed a compact horizontal layer, called the "Grenzhorizont," on which forests grew during the dry Sub-boreal phase of climate. Above this Grenzhorizont more peat is found, and this seems to indicate that once more the climate became damp. The cool, damp years during which this new peat formed constitute the "Subatlantic" Period.

Thus the peat deposits of North-western Europe can give us another time-scale, splitting up the time since the maximum of the last ice-age into seven periods, which may be grouped into three phases—the phase of increasing warmth, the phase of maximum warmth, and the phase of decreasing warmth.

PERIOD 7. SUBATLANTIC. cool and wet.	}	Phase of decreasing warmth.
PERIOD 6. SUBBOREAL. warm and dry.		
PERIOD 5. ATLANTIC. warm and wet.	}	Phase of maximum warmth.
PERIOD 4. BOREAL. warm and dry.		
PERIOD 3. PREBOREAL. cool and dry.		
PERIOD 2. SUBARCTIC. cold.	}	Phase of increasing warmth.
PERIOD 1. ARCTIC. very cold.		

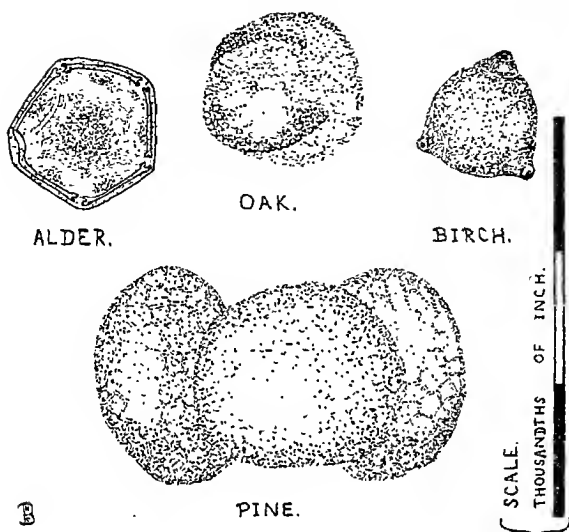


Fig. 8. Pollen of several trees.

Evidently if an implement or a skeleton is found in a peat bog, it is possible, by means of an examination of the sort of peat in which it lies, and of the types of peat above and below it, to date the find in terms of these climatic divisions. For example, if a skull were found in bog-moss peat, and just above it was a hard layer (the Grenzhorizont) and above that more bog-moss peat, it would be reasonable to say that the skull must have become embedded in the bog during the Subboreal period.

But it is not possible always to examine the deposits sufficiently closely to get information as definite as this—and many important finds were made before ever these climatic divisions were thought of. Is it possible to date such finds in any way? If there is a small piece of

peat no larger than a pea still attaching to a flint or a skull, it may be possible to date it by the wonderful technique known as "Pollen Analysis." Take the peat, small though it may be, and digest it for some time with a solution of potash. Then place a small drop of the resulting brown fluid on a microscope slide, and examine it under a high magnification. In the brown liquid, which is all the unaided eye can see, you will discover large numbers of minute grains of pollen, of various sizes and shapes, but mostly only about one eight-hundredth of an inch in diameter. These pollen grains have evidently been incorporated in the peat as it was formed, and have been preserved. Is it possible to identify the plants from which this pollen has been blown? A glance at Figure 8 will make it clear that many of the most common trees have very distinctive pollen grains which can be recognised fairly easily. If you count the number of oak grains present, and the number of pine grains, and so on, it is possible to work out the percentage of each type in the peat. On the deep peat-bogs of Sweden, samples of peat have been taken at different depths in the bog, and examined in this way. It is generally found that the deepest samples, which have been formed during the early phase of increasing warmth, show a great number of birch and also many pine pollen grains. In samples from rather higher up in the peat, which have been formed in the later phase of maximum warmth, oak, elm, lime, alder, and hazel are found to be much more important. In still more recent samples, formed in the phase of decreasing warmth, and from near the surface of the bog, the beech, the hornbeam and the spruce gradually increase in numbers. Thus the time-scale from climatic divisions can be linked together with a time-scale from pollen analysis in this way:

<i>Climatic Divisions</i>	<i>Pollen Analysis</i>
Phase 3 of decreasing warmth	Beech Hornbeam Spruce
Phase 2 of maximum warmth	Oak Elm Lime Alder Hazel
Phase 1 of increasing warmth	Birch Pine

Evidently it is possible to place an implement in its proper position on this time-scale, by an analysis of the pollen in the peat adhering to it. If the implement can also be placed in an archæological period by means of its shape and method of manufacture, it is clearly possible to correlate the various archæological periods with the corresponding climatic and pollen-analytical periods, and therefore with the periods derived from the retreat of the Scandinavian ice and from the history of the Baltic Sea. Such a correlation, showing the dates of the various periods in years, is attempted in Figure 9.

Clearly, climatic and forest changes such as these must have had a very great influence on man's way of life, and indeed were probably largely responsible for the changes that took place in his culture. And, of course, as the climate and plants changed, so did the animals. When it was cold there would be reindeer and steppe animals, as forests spread there would be more woodland animals, as it became warmer the reindeer would disappear, retreating to the north, and so on. It is in the

DATE	EXTENT OF ICE	HISTORY OF CLIMATIC PERIODS	CLIMATIC PERIODS	FOREST TREES	WILD ANIMALS	ARCHAEOLOGICAL PERIODS
10000	ICE	PRESENT	CONTINENTAL	BEECH	ANIMALS	HISTORICAL TIMES.
8000	ICE	BALTIC	WARMTH.	MINERAL	AS	
6000	ICE	SEA.	WARMTH.	SPRUCE	TO-DAY	
4000	ICE	LETTERINA	WARMTH.	LIME.		NEOLITHIC.
3000	ICE	ASA.	WARMTH.	OAK.		
2000	ICE	ANCYLUS	WARMTH.	ELM.		
1000	ICE	LARE.	WARMTH.	ALDER.		MESOLITHIC.
8000	ICE	YOLTER	WARMTH.	MALE.		
6000	ICE	SEA	WARMTH.	FEW.		
4000	ICE	ICE	WARMTH.	SIRCH.		PALEOLITHIC
2000	ICE	DAMMER	WARMTH.	WILLOW.		
1000	ICE	LARE.	WARMTH.			

Fig. 9. Table showing the condition of Western Europe since the last ice-age.

light of all these changes, of climate, of sea-level, of animals, and of plants, that we must try to interpret archaeological discoveries: we must endeavour to picture changing postglacial man in the changing postglacial environment.

CHAPTER VII

A CALENDAR OF THE LAST 14,000 YEARS

'Man was created by the Trinity on 23rd October, 4004 B.C.,
nine o'clock in the morning.'

DR. LIGHTFOOT
Vice-Chancellor of the University
of Cambridge in the seventeenth
century.

HERE AND THERE in this book are scattered various dates. How have these figures been obtained? Quite frankly, they are often mere guesswork. Where one guesses half a million years, another may guess a million—and there is no telling which is the more nearly correct. But recently Scandinavian workers have begun to replace our guesses by accurate dating, as far as the last 14,000 years are concerned.

The last ice-age has left an indelible calendar. As the ice-sheet retreated, the melt-water trickling away from its edges carried sediment into seas and lakes. In the summer, when the melting was rapid, quite heavy particles would be carried along and eventually deposited; while in the winter, when the melting was slow, only fine-grained material would be laid down. As a result, the clay that was formed in the wake of the receding ice shows alternations of coarse and fine material corresponding to summer and winter, and each complete layer or *varve* represents one year. And so if a section is cut in a bed of clay, and the number of varves in it counted, this will give the number of years during which the clay was being deposited. But, of course, all the time the ice was moving further north,

and eventually would be so far from the bed of clay that no more would be deposited. The new varves would be laid down further to the north than the old, and the total effect would be rather like the tiles on a roof, or a pack of cards splayed out—each varve overlapping, and being overlapped by another. All the varves, of course, will not be of equal thickness; a hot year will cause a lot of melting, and hence a thick varve, while a cold year will be represented by a thin one. It is this variation in thickness, just like the variation in the width of the annual rings of a tree, that makes these varves so useful. In actual practice, of course, the varves cannot be seen extending horizontally for miles—there are only vertical sections at the points examined. But so long as these points are sufficiently close together, the individual varves can be recognised by their varying thicknesses, and the number present in one place, but absent from another, will give the number of years taken by the ice to move between these two points.

Such measurements as these have been carried out in Scandinavia, Iceland, the Himalayas, Argentine, Canada, and Scotland, and there is found to be a quite startling degree of varve uniformity in places even so widely separated. But it is with North-western Europe that we are particularly concerned, and it is here that this "geo-chronology," i.e. "earth calendar," has been most carefully recorded. Sections have been examined at intervals of about one kilometre, along a line from the south of Sweden to the Fenno-Scandian moraines, which were formed at the end of the Götiglacial period. There were found to be about two thousand varves altogether along this line—which indicates that the ice took about two thousand years to retreat this distance. Then along a line from these moraines, northwards to those of Jämtland, other measurements were taken, which indicate that the ice took three thousand years to retreat during this, the Finiglacial, period. Thus the Götiglacial and the Finiglacial periods together occupied about five thousand years. The Postglacial phase, since the

formation of the Jamtland moraines, is represented by eight thousand seven hundred varves, and hence occupied this many years—giving a total measured time of thirteen thousand seven hundred, or nearly fourteen thousand years. There are as yet no measurements for the earlier Daniglacial phase.

The significance of geo-chronology is immense. It means that the different time-scales which have been considered in Chapter VI—that based on the recession of the Scandinavian ice-sheet, that based on the history of the Baltic Sea, that based on the method of pollen analysis, and even the various archæological periods themselves—can be dated accurately. We have, in fact, a calendar of the last fourteen thousand years.

CHAPTER VIII

THE FOOD GATHERERS OF EUROPE

c. 8,300 TO 3,000 B.C.

IT HAS BEEN POSSIBLE so far to split the world's cultural history into fairly definite periods. First, other species of man used eoliths, and then went through the Strepyan, Chellean, Acheullian, and Mousterian stages of culture. Then our own species became dominant in Aurignacian times, evidencing considerable artistic ability: the Solutrean race, with little art, but with implements so finely fashioned by the new technique of pressure-flaking as to be in some cases almost transparent, became dominant in places: and then flowered the Magdalenian culture, whose flints were not so perfect, but whose pictorial art was magnificent.

This picture appears fairly simple, but after the retreat of the ice-sheets which dominated the climate of Magdalenian times, the history of European culture becomes much more complicated. The reason for this increasing complexity is probably two-fold. In the first place, during the Great Ice Age of Magdalenian times, the Old World would be split up by ice-sheets into several "culture-tight" compartments. There would be several main regions in which groups of men were isolated for thousands of years. During these millennia, the human groups became differentiated in physical type, i.e. became "races" of mankind, and in cultural achievements. Naturally, when the great thaw set in, and free movement once more became possible, a mingling of these different cultures would take place. Secondly, after the

retreat of the ice, the climate changed, as indicated in Chapter VI, and with it the plants and animals available for food. A hunter in forest lands needs equipment different from that of a food gatherer on sandy plains, and different again from that of a fisherman, so it is not surprising to find that different types of culture were developed. This period after the last ice-age, but before man had learned the art of agriculture, is known as the "Middle Stone Age" or "Mesolithic Period."

The Mesolithic period saw great diversity in cultural types. In Northern Spain, the Pyrenees, Eastern France, Switzerland, Belgium, Yorkshire, and Scotland, there have been found traces of the "Azilian"¹ culture. It is clear from skeletal remains that these people had domesticated the dog, which must have been very useful in the hunt. The climate was still quite cold and the Azilians lived in the mouths of caves. They had some rather poor flint tools, with many small round scrapers, and they used polishers, chisels, and awls of bone. But their most typical cultural remains are two. The first is a "harpoon," which, unlike the Magdalenian "harpoons," is nearly flat in section instead of round, owing to the fact that the improving climate had driven out the reindeer whose *solid* antler was used by the Magdalenians, and allowed the spread of the stag, part of whose *hollow* antler made the Azilian weapon. The other typical cultural element is very peculiar. In the cave at Mas d'Azil, and elsewhere, have been found water-smoothed pebbles, with peculiar and apparently meaningless daubs of paint on them. The fact that many of them bear several dots or dashes has led some archæologists to suppose that they were used as tallies for counting, and the remarkable resemblance of some of them to letters in various alphabets has led others to see in these pebbles the germs of written language. It appears quite likely, however, that these daubs are the last poor remnants of the mighty Magdalenian art. There is no doubt that towards the end of Magdalenian times the cave-paintings

¹ First found at Mas d'Azil.

lost their naturalistic vigour, and became more and more conventionalised. Finally the reduction and conventionalisation became such that the figures would be unrecognisable if there were not intermediate forms for comparison. Figure 10 shows four of these pebbles, two of them derived from a very conventionalised male figure, and two from a female. At first it seems incredible that these daubs should be representations of the human figure, but the evidence of intermediate forms is fairly

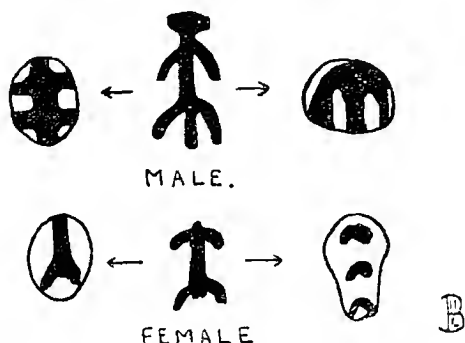


Fig. 10. Derivation of Azilian pebbles from wall-paintings.

convincing. It is interesting to note that the Bushmen of Africa and the Veddas of Ceylon still make such crude designs.

The Azilian culture, and a rather later one known as the "Asturian,"¹ are still comparatively obscure. But while the inhabitants of parts of Europe were making the crude Azilian daubs, and using the flat Azilian harpoons, other cultures were developing elsewhere. It will be remembered that although the Aurignacian culture was replaced in parts of Europe by the Solutrean and the Magdalenian, in other parts these latter cultures never

¹ First found in the Asturias.

spread, and the Aurignacian continued. This was especially the case in North Africa, and possibly Palestine, where the local development of the Aurignacian is known as the "Capsian" culture. In the Upper (i.e. the more recent) Capsian industries, the flake implements get very much smaller, and take on various geometric forms. It is probably from this Upper Capsian of Africa that a similar "pygmy" flake culture of Europe is derived. This pygmy or "microlithic" culture is known in Europe as the "Tardenoisian."¹

The Tardenoisians used scrapers of flint and chert, and occasional bone pins and hafts, but their typical tools are the microliths, which took the forms of graters; of equilateral, isosceles, or scalene triangles; of crescents, lozenges, and rhomboids; and later of trapezes. Many of these microliths are less than half an inch long, and yet within that small compass show the most delicate workmanship. After the microliths had been made, they were usually blunted down the whole or part of one edge, by secondary flaking. These Tardenoisian microliths are too small to have been used as knives—how were they used? A few have actually been found set in bone or wood, but the fact that the Tardenoisians lived almost entirely in sandy or hilly places has led to the decay of most material. But in the Pennines, thirty-five of these pygmy flakes were found, in a perfectly straight line, about $1\frac{1}{2}$ "–2" apart. It is difficult to avoid the conclusion that these flakes represent all that remains of some composite implement—that they were set as teeth in a wooden or bone handle, which has decayed away, leaving the microliths in line. Probably the blunting of one edge was in order to prevent excessive wear on the haft, and the flakes were set into the haft by the use of some mastic.

A very noticeable feature of the Tardenoisian culture is its geographical distribution. In almost all cases, the known sites are on sandy soil or on inaccessible hills. That means, of course, that the Tardenoisians would

¹ First found at Fère-en-Tardenois.

not have to cope with dense forests, which explains their complete lack of heavy flint axes, adzes, or picks. In the Pennines, remnants of a Tardenoisian windbreak shelter of wood and heather have been found, and on the Continent there is also evidence that wooden shelters were used—except in the very early cold days, when cave-mouths were occasionally inhabited.

The early Tardenoisian microliths are very uniform in type all over Europe, but in the later stages those of Great Britain are rather different. This is explained by the fact that at first England was joined to the Continent, and there was easy communication between them, but later, with continued melting of the ice and rise of sea-level, became separated from it. The fauna included the stag, sheep, horse, pig, and dog, and the flora was not vastly different from that of to-day. Moreover, it seems clear that navigation of a sort had been developed, since habitations have been found on hills that were islets in those days. Living as they did in rather inhospitable regions, the Tardenoisians would not have to face the competition of the agricultural peoples when they invaded Europe, and no doubt they lasted on in outlying parts well into the so-called "Neolithic" or "New Stone" Age.

While the microlithic Tardenoisian culture was becoming established in the sandy and hilly parts of Europe, the great plain from Belgium to the Ukraine was fostering a different growth. Here, where the Magdalenians had been established, a gradual change in the technique of flint-knapping took place, and the most typical implement now produced was a point, two or three inches long, with a projection or "tang" at one end. The people who developed this "Tanged-Point" culture lived at the time when the climate was improving, and although the reindeer was still abundant, it was becoming less so. They, like the Tardenoisians, had no heavy axes or adzes or picks, since they lived not in forest but in tundra. But unlike them, they did not retain their culture for long, and it rapidly diminished in importance.

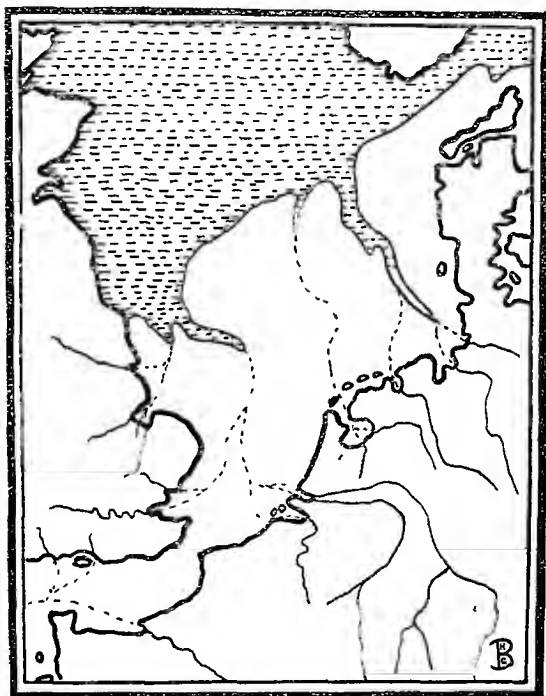


Fig. 11. The North Sea area 5,000 years ago. Present coast-lines deep black; North Sea of that period shaded.

Thus already in Europe we have four different mesolithic cultures: the Azilian, with its painted pebbles and flat harpoons; the Asturian, about which very little is yet known; the Tardenoisian, which was developed in sandy and hilly regions, and lasted throughout mesolithic times; and the Tanged-Point culture of the tundra, which, except in the extreme north, soon died out. These names are very convenient labels, but labelling may be a very misleading process. Things are rarely so simple as they seem, and it is quite likely that future research will reveal connections between these different cultures that are as yet quite unsuspected. This has been shown to be true in the case of another culture, known as the "Maglemosean."¹ At one time the Maglemosean was thought to be an entirely independent culture, but it is now fairly clear that it is of multiple parentage. It was evidently developed in part from an early mesolithic culture known as the "Lyngby Axe" culture, which was an adaptation to the developing European forests, requiring the use of heavy axes and adzes. The people who used these Lyngby axes lived in boggy forest and by lakes, and therefore their implements of bone and antler have been preserved, for peat is a very fine preservative. It seems that the later Maglemosean dwellers in these forests developed the Lyngby axe culture very considerably. Right across the Great Plain of Europe, which, it must be remembered, extended then unbroken from Germany across the North Sea to the Pennines, they hunted and fished and fowled. Instead of the simple Lyngby axes and adzes made from antlers, they used stone heads, set in wooden or antler hafts—and very effective instruments they must have been. With their help, and that of the dog, many an auroch, elk, boar, and deer met its fate.

It is hardly conceivable that they could exist side by side with the makers of Tardenoisian pygmy flints, and be unaffected by them. The Maglemoseans did, indeed, borrow the pygmy or microlithic technique, and

¹ "Maglemose" means "Great Bog."

used it very considerably. This fact has led to some confusion, for uncritical archaeologists have labelled an industry as "Tardenoisian" merely on the evidence of a few microliths, which, of course, is not at all conclusive.

It seems that there was yet a third source of the Maglemosean culture. On the bone and antler axes and adzes, daggers, whistles, awls, bodkins, fish-hooks, knives, and "harpoons" of this period, there is very often considerable decoration. Three main techniques were in use. There was simple incision, there was pricking, and there was drilling. But the interest lies not so much in the techniques as in the motives of the decoration. There was the simple disguising of blemishes in the tool; there were highly conventionalised representations of human and animal figures; and there were purely geometrical motives. Of these last, twenty-four different types have been distinguished. Very many of these twenty-four geometrical patterns are also met with in the late Magdalenian engravings, and it seems likely that this is their source. If this is the case, then the cultural richness of the Maglemoseans, who collected nuts, hunted, boated, fowled, and fished, is probably explained by the fusion of the three cultural streams of Lyngby axe, Tardenoisian microlith, and Upper Magdalenian art.

A rich culture like this, of course, did not remain static. It developed into what is known as the "Ertebølle" or "Kitchen-Midden" culture, around the shores of the Baltic Littorina Sea. Here there was food for the asking—shell fish in abundance; and it is not surprising that, whereas the earlier Maglemoseans appear to have migrated seasonally, the Kitchen-Midden folk remained near the generous waters all the year round.

European man was now living a richer life, but he was still a gatherer of food, not its cultivator.

CHAPTER IX

THE RACES OF MAN

"The equality of the rights of citizens of the U.S.S.R., irrespective of their nationality and race, in all fields of economic, state, cultural, social and political life, is an irrevocable law. Any direct or indirect restriction of these rights . . . on account of the race and nationality to which they belong . . . is punishable by law."

Article 123 of U.S.S.R. Constitution.

IT SEEMS PROBABLE that the differentiation of the human species into the different races that we see to-day was effected while the Old World, which appears to have been the original home of mankind, was split up into several areas separated by the great sheets of ice. For thousands of years human groups were isolated, and underwent considerable modifications: and just as we found that in the evolution of humanoids from the apes, there were many modifications in different directions, so we find that in the differentiation of our own species into its six main races—Australian, Negroid, Mongolian, Alpine, Mediterranean, and Nordic—there is similar complexity.

It is most probable that the Australian race became differentiated in India, and later migrated via Burma and the Malay Archipelago to Australia. This would explain the fact that people of the Australian type are found in the extreme south of India, as well as scattered all along this hypothecated route. The Australians are a very primitive¹ people. They retain a dark pigment, and are very hairy: they have a flat nose and great eye-ridges: and their hair is elliptical in cross-section, like that of

¹ The word "primitive" is used only of physical characters. It carries no judgment of intellect or morals.

the apes. But it will administer rather a shock to complacent "Aryans" to know that blood-tests indicate a closer affinity between Australians and Nordics than between Australians and Negroes !

The other race which retains the primitive characters of dark pigment and flat nose is the Negro. The Negro, however, has fleshy lips and very small eyebrow ridges; he has slender bones which rely for their strength upon great density; he has little hair, and what he has is of a very specialised character, being almost flat in cross-section, and therefore very wavy or even "woolly." In these matters—lips, eye-ridges, bones, and hair, the Negro is less primitive than Adolf Hitler or Dr. Goebbels.

The Mongolian race was cut off from the rest of the world by the great Tibetan ice-sheet, and whilst retaining some pigment and a flat face, lost a great deal of hair, and the primitive eyebrow ridges. Like the Negro, the Mongol developed a specialised type of hair, but, instead of becoming flatter in section, it became almost circular, and therefore lank and straight. He also has a peculiar extra fold of skin at the corner of each eye, which gives him his "slit-eyed" appearance, popularly and quite erroneously attributed to a "slant." His eyes are, in fact, as horizontal as those of any other race.

These three races—the Australian, the Negroid, and the Mongolian—are comparatively easy to identify. The other three are a much more difficult problem, for they have mingled and remingled in Europe for thousands of years. But, even though with difficulty, they can be distinguished. Between the Tibetan and the Ural ice-sheets was an area in which the Alpine race developed its distinctive characters. The Alpines are probably the hairiest people in the world; they have a very robust frame, a heavy jaw, and projecting eyebrow ridges—all primitive characters. On the other hand, unlike the Mongolians, Australians, and Negroes, they have quite prominent noses and but little skin pigment. The name "Alpine" is rather misleading, for people of this type

are by no means confined to the Alps, or even to mountain country. They are found mainly in the great Russian plains, and spread as far afield as North Japan and West America.

While one group of humans was acquiring the distinctively Alpine characteristics in the area bounded by the Ural and the Tibetan ice, another group was isolated between the ice-sheets of the Urals and Scandinavia, and developed a strong physique, fair hair, pale skin, and blue eyes. This "Nordic" race is typically found to-day in Scandinavia, but spreads as widely as Turkestan and the Hindu Kush. There is no doubt about the existence of a Nordic race, even though it has mixed with others. But this is no basis for the absurdly extravagant hypotheses that are so popular in Germany to-day—hypotheses that place "Aryans" as a race superior to all others.

There remains one other race, the Mediterranean, which still occupies its probable original birthplace around the shores of the sea from which it takes its name. Although the Mediterranean race still occupies its old territory, it is by no means confined to it. The Ancient Egyptians and Sumerians were Mediterraneans; so are many modern inhabitants of India and of Wales. The physical characteristics of the race are on the whole primitive—neither hair, skeleton, nor skull show any distinctive specialisation. This fact is rather interesting, for undoubtedly our civilisation was developed almost entirely by early Mediterraneans of Egypt or Sumeria. Evidently anatomical "primitiveness" does not by any means imply mental inferiority.

Figure 12 shows these great ice-sheets bounding the probable homes of the six great races of our species, and on it are also marked the directions in which these races probably spread when the ice barriers melted and diminished. The Alpines fused with the Mongols, and passed over the Behring Straits to Alaska, and thence to all America. The Australians migrated from India via Burma and Malaya to Australia. In their wake, the



Fig 12 Showing centres of differentiation of the races of Man and their subsequent migrations. The ice-sheets which localised them are stippled.

Negroes and Mediterraneans travelled east, and mingled with the Australians and with the Mongols. The result is that the American "Redskins" are of mixed Mongol and Alpine type; the inhabitants of India are predominantly Mediterranean with an admixture of Negro and Australian blood; while in Japan Mongols, Alpines, and Mediterraneans are found. This diffusion and fusion of races was not by any means confined to the east. The Mediterraneans went south to the Equator, and west to the British Isles, where they survive especially in Cornwall, Wales, and Western Ireland. A little later the Alpines invaded Western Europe, and in England have mingled with the Mediterraneans from the south and with the Nordics from the north.

With such racial movements, it is clear that the culture of one region would be carried far and wide, and in fact it seems likely that virtually all the bases of our civilisation—agriculture, dairy farming, weaving, architecture and the moulding of metal and clay—originated at one or two centres, and from them diffused in every direction.

CHAPTER X

THE EARLY CIVILISATIONS OF THE EAST

BEGINNING *c.* 5000 B.C.

"To ingenious attempts at explaining by the light of reason things which want the light of history to show their meaning, much of the learned nonsense of the world has indeed been due."

E. B. TYLOR

"From the first great social division of labour sprang the first great cleavage of society into two classes: masters and slaves, exploiters and exploited."

F. ENGELS

PALÆANTHROPIC, Palæolithic, and Mesolithic men, for all their diversity, had one thing in common. They were all hunters or gatherers of food and not its cultivators. The really great step forward in human culture, the step upon which all subsequent advance depended, was the invention of agriculture. Once this practice had become established, the domestication of animals, the widespread moulding of clay, the weaving of linen and the development of the arts of architecture and stonemasonry followed. This period of invention and consequent growth in population is commonly referred to in Europe as the "Neolithic" or "New Stone" Age, because then the technique of polishing stone, instead of merely chipping it, was developed. Rather later than this so-called "Neolithic Age," Europe passed through a "Bronze Age" and then an "Iron Age." But the use of these terms is very misleading. Metals came into use in Siberia about 1000 B.C., in Denmark about 1600 B.C., in Britain about 2000 B.C., in the Ægean about 3000 B.C.,

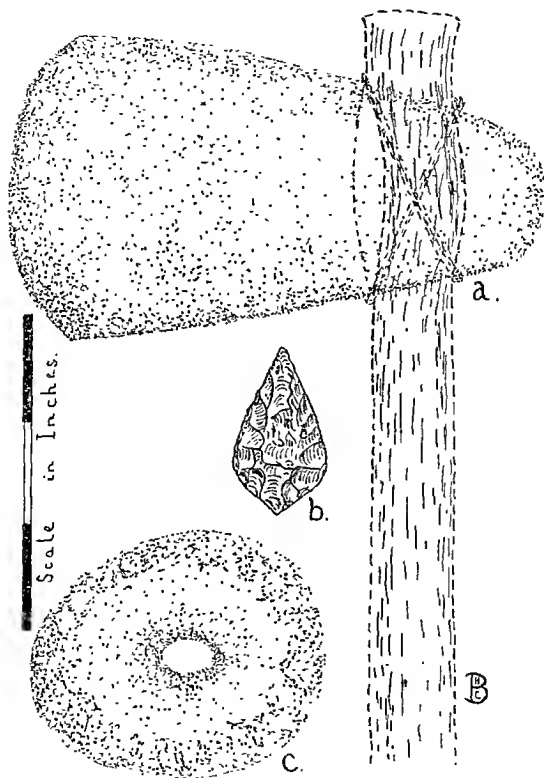


Fig. 13. Neolithic implements: (a) Stone axe, with imaginary shaft of wood; (b) Flint arrow-head; (c) Stone net-sinker.

and in Egypt about 4000 B.C. And so it appears that Siberia was in the "Bronze Age" while Britain was in the "Iron Age," and that while Britain was still in the "Mesolithic Age," Egypt was already using metals! This reference to various "Ages," of doubtful validity even when applied to very early times, becomes hopelessly confusing when used with reference to the last six thousand years, and were better abandoned. The culture of Europe since 3000 B.C. was undoubtedly derived largely from other places, and can be understood only in terms of them.

Egypt has good claims to be regarded as the cradle of our civilisation. It seems likely that barley and millet grew wild on the Nile, and it is certain that the yearly flood made conditions there peculiarly favourable to the invention of agriculture. The early settlers, concentrating in the valley as a result of the increasing desiccation of the once-fertile Sahara, would notice that where the waters overflowed, there the wild barley grew most fully, and the first genius who thought of extending the range of the waters by digging channels in the ground was the inventor of agriculture, and the founder of our civilisation. This simple act, copied by others in the valley, developed into a definite irrigation system, which by allowing of a greater population, led to the building of large villages and towns, and the consequent development of all sorts of social usages. Also, by focusing men's attention upon the necessity for forecasting the annual flood, it led to observations upon the waters of the Nile, and hence to the first calendar. When animals as well as plants were brought under human control, our civilisation was well on its way. "The increase of production in all branches—cattle-raising, agriculture, home handicrafts—gave human labour power the capacity to produce a larger product than was necessary for its maintenance."¹ Of this surplus, the ordinary population obtained part, but the king obtained the lion's share.

With the increase in the size of communities, and the

¹ Engels.

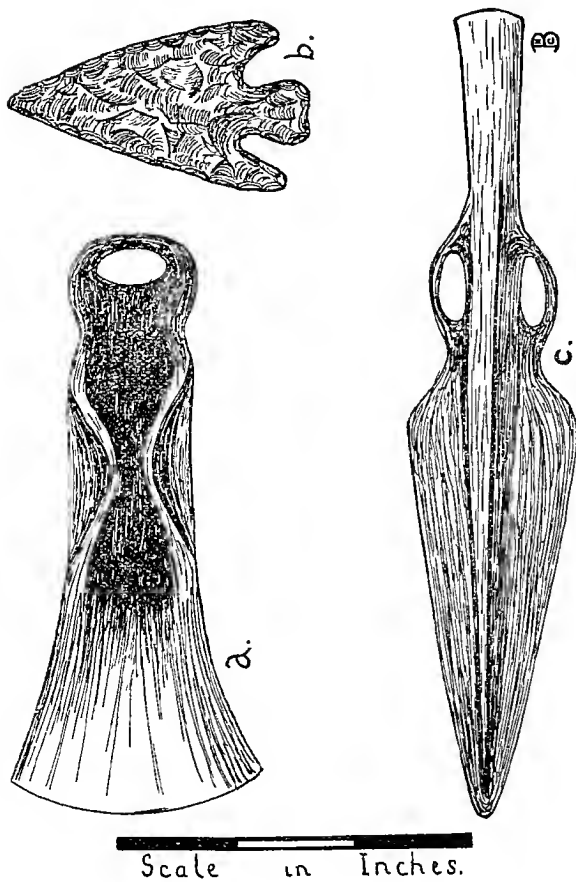


Fig. 14. Bronze Age implements: (a) Bronze axe-head; (b) Flint arrow-head; (c) Bronze spear-head.

increasing demand for goods of all kinds, the class of merchants came into existence. During the "Badarian" period (c. 4500 B.C.) of Egyptian history, copper had already been discovered—probably by the accidental reduction of the green ore malachite, which was in great demand as a cosmetic. By the "Amratian" period, the merchants were bringing lapis-lazuli from Afghanistan, woods from Syria, and gold from Nubia: and by the succeeding "Gerzean" period, they had introduced the idea of casting metals, instead of merely working them.

The 1st Dynasty, starting about 3100 B.C., found Egypt in possession of all the main bases of civilisation. By this time the Egyptians had colonised Syria to exploit the cedars of Lebanon, and the Royal Arms had been left on the copper mines of Sinai. Now the Pharaohs set themselves to build great pyramids, selfish monuments which absorbed nearly all the wealth and energy of the state. But not for long were the king-gods to have undisputed sway. The priests of Heliopolis, who were constantly observing the heavens, found that it was possible to forecast the all-essential annual floods more accurately by means of the sun than by the moon or river. Apart from the fact that it led to the gradual ousting of the river-god Osiris by the sun-god Re, this discovery had great sociological consequences. The power which this discovery bestowed upon the Heliopolitan priests forced the ruling Pharaohs to share authority with them, and the absolute king was no longer absolute. Moreover, the lower classes were evidently not content with their lot, and took matters into their hands. One Ipuwer, a writer of the 10th Dynasty (2375–2000 B.C.), laments that "poor men possess fine things. He who once made for himself no sandals, now possesseth riches. . . . Nay, but the high-born are full of lamentations and the poor are full of joy. Every town saith, 'Let us drive out the powerful from our midst' . . . the King is taken away by poor men. . . . Behold, the Judges of the land are driven out through the land." With a weakened executive, a rebellious lower class, and an empire struggling to be

free, the "Old Kingdom" (Dynasties 3-6) collapsed. The power of the king was restored in the time of the "Middle Kingdom" (Dynasties 9-13), and again, after a further fall, by the 18th Dynasty, which, diverting attention from inner weakness by a bold foreign policy, reconquered Syria and Palestine. But the heyday of dictatorial kingship was at an end, and Egypt's ancient civilisation collapsed once more—and this time finally.

It is by no means certain that Egypt was the birth-place of civilisation. Before 3000 B.C. a magnificent culture was in existence in Elam and Sumer, and also in the Indus valley. Certainly the Sumerians had an organisation that many modern nations might envy. The irrigation system, the rate of interest on loans, the penalties for erring judges and physicians, the contract of marriage, and even divorce, were all regulated down to the smallest detail. Here are two of the laws of Hammurabi (2130-2087 B.C.): "If a man neglect to strengthen his dike, and do not strengthen his dike, and a break be made in his dike, and he let the water carry away the farmland, the man in whose dike the break has been made shall restore the grain which he has damaged." "If a builder erect a house for a man and do not make its construction firm, and the house which he built collapse and cause the death of the owner of a house, that builder shall be put to death." Many of these laws were rather drastic, but they must have been very effective!

The third state, that of the Indus valley, is as yet but little known, but it is clear that the cities were carefully planned and well drained, and for some of the water courses bitumen was brought right from Babylon! Which of these three states was the parent of the others is not yet certain; at present it is probably best to leave the question open, and refer to the three jointly as the "Archaic Civilisation."

Gradually moving out from its early home, accepting some new ideas and dropping some old, this archaic civilisation spread to the ends of the earth. The earlier Catholic missionaries to Mexico were astonished to find

there among the pagan Aztecs all the ceremonial elements of their own religion. There was the same story of the Flood, the same symbol of the Cross, the same consecration and ritual eating of the Flesh of God (but made of maize instead of wheat). The head and lips were touched by water in Baptism "that cleansed by these waters they might live and be born anew"—and the good priests were astonished because they believed their own Christian religion to be unique and entirely new. But like that of the Aztecs, their religion took shape in the archaic civilisation, and they need not have been astonished. Not only our religious rites, but the whole foundation of our daily life, we owe to the people of Egypt, Sumeria, and the Indus valley.

CHAPTER XI

THE EVOLUTION OF THE STATE

"The history of all hitherto existing society is the history of class struggles."

MARX and ENGELS

IF IN A HUNDRED YEARS' TIME, a modern grave were to be excavated, the investigator might derive considerable information. He might be able to tell from the skeletal remains the race to which the occupant belonged. He might find evidence in the grave of a high degree of technical skill, and evidence of certain religious rites. But he would be able to tell very little of the political and social system of the society to which the individual belonged. It is with just such a difficulty that the student of pre-history is confronted. We know the types of tools used by the Chelleans, the Magdalenians, and the Tardenoisians—but what sort of a society was theirs? The answer we can never find by excavation, but it is possible that primitive tribes of historical times may throw some light on the question.

It seems that in very early communities the family as we know it was non-existent. There *was* a "family," but of a very different kind. Each such "family," known as a "gens," consisted of those known to be of common descent *on the mother's side*. Thus a man would be considered a close relative of his sister's son, but not of his own son. It is clear that this type of "matrilinear" family is suited to a society in which the mother is known, but the identity of the father is in doubt. The various gentes constituted the tribe, and if a gens

became large and unwieldy, it split into several daughter gentes. In each gens there was perfect democracy. Each and every member of the gens, male or female, had the right to attend at all discussions of gentile matters and to take a full part in the discussion and voting. There were chiefs, it is true, but they were elected, and often elected only for a specific occasion. In such primitive communities there was a type of communism. Most things were held in common by the gens, and everyone hunted and worked for the common good. Man had not developed his means of production to such a stage that any individual could produce appreciably more than he could consume, and so even if the idea of slavery had entered the mind of a member of the gens, and even if public opinion had tolerated such an idea, it would never have come to fruition, since the slave would consume all that he produced, and so would be of no benefit to his owner. This primitive society had no room for slavery, it had no room for private property; it was a classless society.

From this simple society, which is presumed to have been common to the early stages of all races, there had evolved by 3000 B.C. the king-god dictatorship of the Pharaohs. Of the mechanism of this change we have absolutely no record. The same applies to the civilisations of Sumer and the Indus: in some way the primitive gentile society had changed its form beyond recognition, but we know not how.

From the archaic civilisation of Egypt and Mesopotamia, the essentials were selected by the people of Crete. Here recent excavations have brought to light evidence of a highly developed culture, by no means a mere slavish copy of those of the East. It seems that Crete developed a maritime trade, and was soon the main partner in a great maritime confederacy of the Aegean Sea, this confederacy probably including Troy, the Cyclades and the Greek mainland. At first the wealth accumulated from this trade was fairly evenly distributed between the various peoples, but later the Lords of the

great town of Knossos concentrated most of the wealth in their own hands. Here at Knossos was built the wonderful palace of the great King Minos after whom the culture of this period is called the "Minoan." From the fairly equal distribution of wealth characterising the "Early Minoan" period (about 3400-2100 B.C.), there developed the Knossos domination of the later years, and in 1400 B.C. Knossos was destroyed by fire, possibly natural, but most probably the result of sacking by rebellious subjects on the mainland.

This sacking was the end of the domination of the Ægean by Crete, and the focus of the Ægean civilisation passed to Mycenæ. Here the culture was developed, but eventually the Mycenæans themselves were overcome by invading tribes, the Greeks. These invading tribes destroyed much of the Mycenæan culture, but absorbed sufficient of it to set them on the path to the development of a distinctive culture of their own, one of the most beautiful the world has ever known.

In the earliest writings of the Greeks, there is evidence that already the patrilinear family had become established, and already the rule that marriage must be outside the gens had evidently been relaxed. Indeed, as far as actual written history is concerned, the gens appears only as a form of organisation with no obvious sexual basis, and the form of government is far removed from the suggested primitive democracy. But although there is no actual written record of the way in which the change from the primitive gentile system took place, and indeed no actual written record of its previous existence among the Greeks, it seems likely that the change had in fact taken place, and had taken place as a result of economic advance. Probably, as trade developed, at first perhaps between gentes and later between individuals; as the means of production, such as land and ploughs and ships, became privately owned; there grew up within the once free and equal gentile society, classes of rich and poor, debtor and creditor, mortgage-holder and mortgagee. The rich man would find that he had

more in common with the rich man of another gens than with the poor man of his own, and a class and craft loyalty would grow up at first alongside and then instead of the older gentile loyalty. Add to this the increasing necessity for geographical rather than sexual organisation, the establishment of slavery of prisoners of war and then of defaulters on mortgages, and it is clear that the old gentile society would no longer be an efficient form of government. With the increasing poverty of the masses, whose decaying bodies fertilised the soil out of which blossomed the flower of Greek culture, it became necessary for the wealthy classes to institute some instrument of coercion, to force the lower classes to accept the increasingly unequal social order. In the primitive gentile society no such apparatus was either possible or necessary, for there all the members of the tribe were armed, and all were equal. This apparatus of coercion was formed, and the *State* was born. At its birth, as through its life and until its death, the function of the State is to keep in submission those who have been subjected to expropriation. Generally under a guise of equality and neutrality, the State apparatus—the police, the armed forces, the judicature—serves the class which happens to wield economic power. In Athens of this period this was the wealthy trading aristocracy. The impoverished and dispossessed classes did not accept the inequalities of the economic organisation without murmur, and from time to time extracted both economic and political concessions from the State. But, taken generally, the rise of the beautiful culture of the Greeks took place only at the expense of the material and moral depauperisation of the majority of the people.

Among the Greek city-states there was fierce economic and military competition. In 404 B.C. Sparta put an end to the hegemony of Athens; in 371 B.C. Thebes performed a like operation on Sparta; and in 338 B.C. Macedon gained control of all Greece, and eventually of most of the Mediterranean and Near East. But another power had meanwhile arisen in the peninsula

of Italy. This power, Rome, was to extend its dominion far and wide over the Western world. In Rome, as in Greece, the gentile society was rapidly replaced by a system based on wealth instead of on sexual affinity, and the Roman State was born. But, just as in Greece, this institution of the State did not evolve simply and purely out of the necessities of the evolving economic system, but was influenced by the changes that had already taken place in the more highly developed societies of the time.

When the civilisation of Rome was submerged under the succeeding barbarian flood, a great deal in the way of literary and artistic achievement was lost, and much of the elaborately constructed State apparatus was broken down, but when civilisation was built anew, it had the solid foundation of classical technical achievement on which it might be built more richly. It is customary to regard the overthrow of the Roman Empire by the barbarian tribes as an unmitigated disaster, as the defeat of achievement by retrogression. But there is another side to the picture. In the highly developed Roman State, it had become shameful for a free man to work, all sorts of vices had appeared and waxed common, society had reached a state where a new influx of vigour was essential to further progress. This new vigour was supplied by the barbarians. They still had a society organised on gentile lines, where men were approximately equal and women were respected. Their very barbarianism, their primitive gentile organisation, infused a new life and a new vigour into the decaying Roman world.

In the course of settlement, the gentes became transformed into village communities or "marks," which absorbed the conquered inhabitants, and became the new units of organisation. Once more the old story was repeated, and certain individuals gathered the power and the wealth unto themselves. As a payment for protection against marauders, powerful men claimed land from the less powerful, thereby reducing the small free-

men to the status of tenant or serf. The most powerful became princes and kings, and the feudal state was born. From the time of the Romans to the ninth century of our era, there had been little or no technical advance. There was at the end of the period a possessing class and a dispossessed class, just as there had been at the beginning. But something had been achieved. The people of Western Europe had been differentiated into the modern nations, in which the serfs had the possibility of achieving freedom.

From the mark communities of Europe there developed the feudal states of the ninth and tenth centuries. King, Lord, Freeman, and Serf were the main links in a chain of mutual duty and obligation. In return for land, the lord owned allegiance to the king, and the freeman and the serf owed allegiance to the lord. The whole atmosphere of feudalism was for most of the people one of confinement—the serf was bound to the land and passed with it from one overlord to another. He could not leave his lord's lands, but was bound to them body and soul. But then in the eleventh and twelfth centuries there was a great revival of trade in the Mediterranean and a great development of trade in the Baltic, and this led eventually to the downfall of the feudal system. For at the sites of the great fairs that developed there grew up towns in which the merchants wanted freedom from the cramping restrictions of the feudal lords. The merchants, organised in their guilds, gradually achieved a considerable degree of freedom from the feudal overlords, who were glad of the money the merchants could provide. The freedom of the merchant towns, and the possibility of attaining wealth therein, had a considerable attraction for many of the feudal serfs, and often they risked death in order to escape from their lords.

Each of these merchant towns built up an intense local patriotism, and merchants from another town were as unwelcome as those from another country. This may explain why those countries, Germany and Italy, where the merchant towns first became strong, were the last to

achieve strong central national control. And in those nations which developed a national consciousness early, there grew up a dislike of domination by Rome, a dislike which resulted in the Reformation. Meanwhile, as the merchant class became stronger, great changes were taking place in the condition of the poorer people. In Britain after about A.D. 1450, the lot of the peasant was becoming progressively worse, until in the time of Elizabeth the country was swarming with paupers. In the sixteenth century vast areas of land were being enclosed, and given over to the profitable farming of sheep, while the former inhabitants of the land became landless. But while these enclosures caused the most atrocious suffering, they did make possible at a later stage the more efficient use of the land, and they were instrumental in providing the dispossessed workers who were essential to the development of capitalism.

The rudiments of capitalism had developed as early as the thirteenth and fourteenth centuries in the city-states of Italy, but before the system could develop on a really large scale, a great dispossessed class of labourers was necessary. In England of the sixteenth century and onwards this class was available. The primary accumulation of capital proceeded apace—by the trade in slaves, by the exploitation of the East and the Americas, by piracy and by theft. With capital available, with a large class of paupers, the conditions were ripe for the industrial revolution, and, at the expense of the lives of millions of men, women and children, the magnificent structure of capitalism was erected. By three hundred years of violence, the system achieved dominance which was to increase the potentialities of human production ten-fold and a hundred-fold. But though the capitalists now were the economic power in the land, the feudal lords and the king still retained political power, especially in France. The feudal system had nourished in its body the vigorous growth of capitalism, and in the French Revolution of 1789 the lusty child wrested political power from its parent.

CHAPTER XII

THE WITHERING OF THE STATE

"The society that organises production anew on the basis of a free and equal association of the producers will put the whole State machine where it will then belong: in the museum of antiquities, side by side with the spinning wheel and the bronze axe."

ENGELS

WITH THE ATTAINMENT of political power by the bourgeois capitalists, the stage was set for the final struggle. Within the gentile society there had developed difficulties which were incapable of complete solution within the framework of gentile society. Gentile society was overthrown. Within feudal society there developed difficulties which were incapable of solution within feudal society. Feudal society was overthrown. Within capitalist society there have developed difficulties which are incapable of solution within capitalist society. Capitalist society will be overthrown.

What are these difficulties that will lead of necessity to the fall of capitalism? They are those very qualities which in the early days of capitalism led to its great development. Of the wealth produced under capitalism, part goes to the workers in the form of wages, and part goes to the capitalists. The distribution of the wealth that has been produced is very unequal, and this inequality is so great that as a class the capitalists are unable to spend on consumers' goods all the money which they receive. They do not merely hoard the excess, however, but buy with it new means of production, i.e. they invest it. It was this utilisation of part of

the wealth produced, to buy not consumers' goods, but new means of production, that led to the possibility of the expansion of capitalism and the increase of the world's productive powers. But although it was thus the very inequality of the distribution of wealth that led to the increase in the productive power of the world, it is now that same inequality which prevents the world's obtaining the benefits of that increase. For since the purchasing power of the bulk of the population has not increased to anything like the same extent as the productive powers of society, there occur periodically gluts of consumers' goods, side by side with great poverty. And it is only when this glut has been destroyed that the capitalist economy can once again produce goods with a profit. The situation is aggravated by the fact that the newer means of production that are ever being brought into use are in general more efficient than the old, and tend to throw more and more people out of work. With the increasing concentration of the means of production in the hands of fewer and fewer capitalists, and with the search for markets overseas leading to imperialist wars, the situation becomes ever more acute. Not only is the worker prevented by the economic system from reaping the full benefits of his labour, and not only is the capitalist finding it more and more difficult to find a field for investment which will produce a profit, but both worker and capitalist are liable to be blown to pieces because of the system that robs the one and becomes less profitable for the other.

Under conditions such as these, two things are possible. Either society changes its economic and political system, and goes on to new heights of achievement, or society dissolves in the midst of wars and revolutions. With the example of the U.S.S.R. before the world, we may be reasonably confident that it will take the former course. But the rapidity with which it will do so, and the amount of suffering that will be involved in the transition, depend on the extent to which proletarian political parties see the necessity for a thorough under-

standing of the functioning of the capitalist State, and having achieved such understanding, act fearlessly in accordance with its dictates. Where such understanding is not reached sufficiently quickly, there capitalism will break the workers' organisations, and will achieve an extension beyond its proper term, in the brutal form of fascism. Where such understanding is reached and acted upon, there a workers' State will be built.

What will be the nature of this first State of the workers? We have seen above that a State organisation is and always has been necessary in order to keep in subjection those who have been expropriated. It will therefore be necessary in the early days of the workers' power, to retain a State apparatus to keep in subjection the expropriators who have now themselves been expropriated. This has been expressed generally as "the period of the dictatorship of the proletariat." This is an unfortunate phrase, for the idea connoted by the word "dictatorship" has changed considerably. The phrase in this context means "the rigid and iron rule of the proletariat over the late capitalists" and since the proletariat are in the immense majority in most European States, there is no dictatorship at all in the common meaning of the word. But whatever word be used to express it, some such unbending rule will be essential. During this period, a socialist economic system will be built up, as it has already been in the U.S.S.R. In such a system the whole economy will be planned, and hence the proportion of the total wealth which is allocated to consumers' goods, and the proportion which is allocated to increase of the means of production, will be determined by conscious planning. Furthermore, there will be no such great disparity in wealth that some individuals will be unable to spend all they have, while others will be unable to buy that they need. Hence those two nightmares of capitalism, the periodic slump and chronic unemployment, will be non-existent. In addition to this, such a planned economic system will need no continually expanding *external* market, and a prime cause of war

will be removed. Such a system of society will itself be a great improvement on the capitalist.

But the evolution of society will not stop there. With the abolition of classes, the dying out of those who have been dispossessed, and the gradual removal of the morals and habits of mind generated by years of capitalism, the need for a State apparatus will disappear. If there be no ruling class and no ruled, there is no need for an apparatus designed to coerce the ruled to do the will of the rulers. When it is possible to rely upon the spontaneous goodwill of all citizens to keep order, and when people are willing to work according to their abilities and receive according to their need, society will return in communism to a state of society very similar to that of the earliest tribes, but it will return with all the control over Nature that has been achieved through thousands of years of struggle and cruelty.

SUGGESTIONS FOR FURTHER READING

MOST of the recent work on the topics discussed in this book is in the pages of rather inaccessible journals, but the reader who wishes to pursue these topics further can find considerable information, albeit often rather out of date, in quite easily accessible books.

The Pelican series for instance has such books as the following :

BELL: *Civilisation.*

PERRY: *The Growth of Civilisation.*

WELLS: *Short History of the World.*

WOOLLEY: *Digging up the Past and Ur of the Chaldees.*

The Home University Library includes excellent books such as:

THOMSON and GEDDES: *Evolution.*

MARETT: *Anthropology.*

BURKITT: *Our Forerunners.*

HOGARTH: *The Ancient East.*

For illustrations of the various ancient human cultural remains, the reader had better go to one of the pioneer books, now hopelessly incomplete and even incorrect, but still valuable for their illustrations. Such books are :

SOLLAS: *Ancient Hunters.*

LUBBOCK: *Prehistoric Times.*

OSBORN: *Men of the Old Stone Age.*

An exceedingly interesting account of the evolution of man will be found in :

ELLIOT SMITH: *Essays on the Evolution of Man.*

Probably the best description of European climate, geography, plants, animals, and men during the Mesolithic period is :

CLARK, J. G. D.: *The Mesolithic Settlement of Northern Europe.*

For a discussion of the evolution of human society, a pioneer book, now rather dated but still invaluable, is :

ENGELS: *The Origin of the Family.*

For recent times an excellent book is :

HUBERMAN: *Man's Worldly Goods.*

